Appendix 20

Petitioners' Exhibit 1010 (Part 3 of 3)
Google et al. v. KT Corporation et al.
IPR2025-00293

www.3gpp.org / ftp / Specs / archive / 36_series / 36.213

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141 items.

Appendix 21

The Wayback Machine - https://web.archive.org/web/20140326143430/http://3gpp.org/ftp/tsg_ran/

3gpp.org - /ftp/tsg_ran/

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Appendix 22

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Appendix 23

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Appendix 24

3GPP_TSG_RAN_WG1 Archives

March 2014, Week 3

3GPP_TSG_RAN_WG1@LIST.ETSI.ORG

Options: Use Monospaced Font
Show Text Part by Default
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Dear all,

Please here enclosed is the draft agenda distributed by Mr Chair with Tdoc number R1-141100.
I would recommend you to follow the usual recommendations:
Make sure you have registered to the meeting @ link: http://webapp.etsi.org/3GPPRegistration/ – this is basic practice to help both the host and MCC providing good facilities to the group - Once you are registered but cannot attend for any good reason, please don't forget to cancel your registration

You're of course invited to send your Tdoc requests using the attached template... according to the submission deadlines as indicated in R1-141100.
Below table shows a set of incoming LSs - thxs to the relevant companiesfor presenting them under AI 5 - files are also enclosed for your convenience

Source	Original Tdoc nbr	RAN1 Tdoc nbr	To	Cc	Title	Respons (Ic LS)
R2	R2-140891	R1-141103	R1, R3		LS on improvements to EUL coverage by TTI switching	
R2	R2-141003	R1-141104	R1		Reply LS on LTE coverage enhancement	R1-13606 (R2-1400
R2	R2-141004	R1-141105	S2	R1, R3, R4	Reply LS to S2-133846 = R2-133066 on GCSE with eMBMS	S2-13384 (R2-1330
R2	R2-141007	R1-141106	R1		LS on RACH Aspects with eIMTA	
NGNM		R1-141107	NGNM	RAN, R1, R3	Liaison to 3GPP RAN, RAN1 and RAN3 on consolidated operator view on eCoMP standardization	
R4	R4-140596	R1-141108	R2	R1	LS on deployment scenario for Intra-band Non-contiguous CA	
R4	R4-141235	R1-141109	R1		Reply LS on half duplex FDD operation for Low complexity MTC UE	R1-13494
R4	R4-141254	R1-141110	RAN	R1	LS on BS classes and maximum BS power on 256QAM	
RAN	RP-140510	R1-141111	R4	R1	Reply LS to R4-141254 = RP-140024 on BS classes and maximum BS power on 256QAM	R4-14125 (R1-1411
S2	S2-140846	R1-141112	R2, R3, R1, S1, S4, C4, C1		LS on GCSE QCIs and connected mode DRX	
S2	S2-140847	R1-141113	C1, C6, S3, R2, R1		LS on Provisioning of ProSe configuration information in a public safety ProSe enabled UE	

Patrick Mérias
Mobile Competence Center
http://www.etsi.org

Telephone: +33 (0)4 92 94 42 06
Mobile: +33 (0)6 07 59 08 47
E-Mail: [log in to unmask]

Please consider the environmental impact before printing this e-mail

ATOM RSS1 RSS2

Appendix 25

3GPP_TSG_RAN_WG1 Archives

April 2014, Week 1

3GPP_TSG_RAN_WG1@LIST.ETSI.ORG

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Subject: [RAN1#76b]: Minutes from Shenzhen
From: Patrick Merias <[log in to unmask]>
Reply To: Patrick Merias <[log in to unmask]>
Date: Mon, 7 Apr 2014 13:07:28 +0000
Content-Type: multipart/mixed
Parts/Attachments: text/plain (722 bytes) , text/html (5 kB) ,
Draft_Minutes_report_RAN1#76bis_v010.zip (1 MB)

Dear all,

Hope you all returned safely…
Enclosed the minutes from last week RAN1#76bis
This version still need some clean-up and shall further be updated with the results of our on-going email discussions
Please note that I still need to align the minutes with Tdoc_list (especially w.r.t the // sessions) – so some treated documents may still be viewed as “Not treated” – and will need further corrections
I will also perform a full check of the attendance and attach the participants list to the next version
Your comments are much appreciated
BR
P

Patrick Merias
Mobile Competence Center
Technical Officer
mailto:[log in to unmask]
☏+33 (0)4.92.94.42.06

Please consider the environmental impact before printing this e-mail

ATOM RSS1 RSS2

Appendix 26

www.3gpp.org / ftp / tsg_ran / WG1_RL1 / TSGR1_76b / Docs

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141431.zip	2014/03/22 21:34	47,2 KB
R1-141432.zip	2014/03/22 21:34	37,6 KB
R1-141433.zip	2014/03/22 21:34	24,5 KB
R1-141434.zip	2014/03/22 21:34	368,6 KB
R1-141435.zip	2014/03/22 21:34	96,3 KB
R1-141436.zip	2014/03/22 21:34	88,6 KB
R1-141437.zip	2014/03/22 21:34	84,9 KB
R1-141438.zip	2014/03/22 21:34	34,2 KB
R1-141439.zip	2014/03/22 21:34	115,4 KB
R1-141440.zip	2014/03/22 21:35	43,7 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141442.zip	2014/03/22 21:35	263,7 KB
R1-141443.zip	2014/03/22 21:35	475,8 KB
R1-141444.zip	2014/03/22 21:35	34,2 KB
R1-141445.zip	2014/03/22 21:35	244,6 KB
R1-141446.zip	2014/03/22 21:35	173,9 KB
R1-141447.zip	2014/03/22 21:35	366,8 KB
R1-141448.zip	2014/03/22 21:35	340,1 KB
R1-141449.zip	2014/03/22 21:35	168,4 KB
R1-141450.zip	2014/03/22 21:35	100,9 KB
R1-141451.zip	2014/03/22 21:35	511,6 KB
R1-141452.zip	2014/03/22 21:35	69,4 KB
R1-141453.zip	2014/03/22 21:35	276,8 KB
R1-141454.zip	2014/03/22 21:35	233,4 KB
R1-141455.zip	2014/03/22 21:35	215,3 KB
R1-141456.zip	2014/03/22 21:35	68,2 KB
R1-141457.zip	2014/03/22 21:35	50,7 KB
R1-141458.zip	2014/03/22 21:35	61,9 KB
R1-141459.zip	2014/03/21 19:50	124,1 KB
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R1-141461.zip	2014/03/21 19:50	25,8 KB
R1-141462.zip	2014/03/22 21:35	48,8 KB
R1-141463.zip	2014/03/22 21:35	52,8 KB
R1-141464.zip	2014/03/22 21:35	315 KB
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R1-141466.zip	2014/03/22 21:36	496,3 KB
R1-141467.zip	2014/03/22 21:36	168,4 KB
R1-141468.zip	2014/03/22 21:36	39,7 KB
R1-141469.zip	2014/03/22 21:36	131,2 KB
R1-141470.zip	2014/03/22 21:36	37,1 KB
R1-141471.zip	2014/03/22 21:36	98,1 KB
R1-141472.zip	2014/03/22 21:36	38,1 KB
R1-141473.zip	2014/03/22 21:36	231 KB
R1-141474.zip	2014/03/22 21:36	52,7 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141477.zip	2014/03/21 19:50	21,2 KB
R1-141478.zip	2014/03/21 19:50	40,8 KB
R1-141479.zip	2014/03/21 19:50	894,4 KB
R1-141480.zip	2014/03/21 19:50	40 KB
R1-141481.zip	2014/03/21 19:50	599,7 KB
R1-141482.zip	2014/03/22 21:36	41,3 KB
R1-141483.zip	2014/03/22 21:36	45,4 KB
R1-141484.zip	2014/03/22 21:36	61,8 KB
R1-141485.zip	2014/03/22 21:36	129 KB
R1-141486.zip	2014/03/22 21:36	764,8 KB
R1-141487.zip	2014/03/22 21:36	46,6 KB
R1-141488.zip	2014/03/22 21:36	39,9 KB
R1-141489.zip	2014/03/22 21:36	33,1 KB
R1-141490.zip	2014/03/22 21:36	49,3 KB
R1-141491.zip	2014/03/22 21:36	31,8 KB
R1-141492.zip	2014/03/22 21:36	75,5 KB
R1-141493.zip	2014/03/22 21:36	917,4 KB
R1-141494.zip	2014/03/22 21:36	226,7 KB
R1-141495.zip	2014/03/22 21:36	72,6 KB
R1-141496.zip	2014/03/21 19:50	216,6 KB
R1-141497.zip	2014/03/21 19:50	103,4 KB
R1-141498.zip	2014/03/21 19:50	63,5 KB
R1-141499.zip	2014/03/21 19:50	367,3 KB
R1-141500.zip	2014/03/22 21:36	22 KB
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R1-141502.zip	2014/03/22 21:36	27,6 KB
R1-141503.zip	2014/03/22 21:36	280,9 KB
R1-141504.zip	2014/03/22 21:36	27,2 KB
R1-141505.zip	2014/03/22 21:36	77,8 KB
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R1-141507.zip	2014/03/22 21:36	23,4 KB
R1-141508.zip	2014/03/22 21:36	67,5 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141512.zip	2014/03/21 19:50	86,4 KB
R1-141513.zip	2014/03/21 19:50	34,9 KB
R1-141514.zip	2014/03/21 19:50	49,6 KB
R1-141515.zip	2014/03/21 19:50	41,8 KB
R1-141516.zip	2014/03/21 19:50	39,2 KB
R1-141518.zip	2014/03/22 21:36	144,3 KB
R1-141519.zip	2014/03/22 21:36	41,1 KB
R1-141520.zip	2014/03/22 21:36	36,9 KB
R1-141521.zip	2014/03/22 21:36	20,8 KB
R1-141522.zip	2014/03/22 21:36	19,8 KB
R1-141523.zip	2014/03/22 21:36	141,6 KB
R1-141524.zip	2014/03/22 21:36	53,2 KB
R1-141525.zip	2014/03/22 21:36	32 KB
R1-141526.zip	2014/03/22 21:36	25,7 KB
R1-141527.zip	2014/03/21 19:50	27,3 KB
R1-141528.zip	2014/03/21 19:50	27,5 KB
R1-141529.zip	2014/03/21 19:50	42,1 KB
R1-141530.zip	2014/03/21 19:50	16,4 KB
R1-141531.zip	2014/03/21 19:50	20,9 KB
R1-141532.zip	2014/03/22 21:36	97,5 KB
R1-141533.zip	2014/03/22 21:36	46,1 KB
R1-141534.zip	2014/03/22 21:36	80,8 KB
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R1-141536.zip	2014/03/22 21:37	21,5 KB
R1-141537.zip	2014/03/22 21:37	18,2 KB
R1-141538.zip	2014/03/22 21:37	91,2 KB
R1-141539.zip	2014/03/21 19:50	68,3 KB
R1-141540.zip	2014/03/21 19:50	33,9 KB
R1-141541.zip	2014/03/21 19:50	32,1 KB
R1-141542.zip	2014/03/21 19:50	232,1 KB
R1-141543.zip	2014/03/22 21:37	67,6 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141546.zip	2014/03/22 21:37	244,9 KB
R1-141547.zip	2014/03/22 21:37	50 KB
R1-141548.zip	2014/03/22 21:37	64,9 KB
R1-141549.zip	2014/03/22 21:37	137,3 KB
R1-141550.zip	2014/03/22 21:37	646,3 KB
R1-141551.zip	2014/03/22 21:37	186,1 KB
R1-141552.zip	2014/03/22 21:37	26,1 KB
R1-141553.zip	2014/03/22 21:37	25,7 KB
R1-141554.zip	2014/03/22 21:37	30 KB
R1-141555.zip	2014/03/22 21:37	32,8 KB
R1-141556.zip	2014/03/22 21:37	28,5 KB
R1-141557.zip	2014/03/22 21:37	154,9 KB
R1-141558.zip	2014/03/22 21:37	97,2 KB
R1-141559.zip	2014/03/22 21:37	73,1 KB
R1-141561.zip	2014/03/22 21:37	120,1 KB
R1-141562.zip	2014/03/22 21:37	427,6 KB
R1-141563.zip	2014/03/22 21:37	14,9 KB
R1-141564.zip	2014/03/22 21:37	48,8 KB
R1-141565.zip	2014/03/22 21:37	148,9 KB
R1-141566.zip	2014/03/22 21:37	36,7 KB
R1-141567.zip	2014/03/22 21:37	33,7 KB
R1-141568.zip	2014/03/22 21:37	30 KB
R1-141569.zip	2014/03/22 21:37	27,6 KB
R1-141570.zip	2014/03/22 21:37	36,5 KB
R1-141571.zip	2014/03/22 21:37	139,7 KB
R1-141572.zip	2014/03/22 21:37	21,5 KB
R1-141573.zip	2014/03/22 21:37	39,1 KB
R1-141574.zip	2014/03/22 21:37	19,2 KB
R1-141575.zip	2014/03/22 21:37	24,2 KB
R1-141576.zip	2014/03/22 21:37	60,7 KB
R1-141577.zip	2014/03/22 21:37	15,4 KB
R1-141578.zip	2014/03/22 21:37	40,6 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141582.zip	2014/03/22 21:37	28 KB
R1-141583.zip	2014/03/22 21:37	67,9 KB
R1-141584.zip	2014/03/22 21:37	60,2 KB
R1-141585.zip	2014/03/22 21:37	53,3 KB
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R1-141588.zip	2014/03/22 21:37	38,3 KB
R1-141589.zip	2014/03/22 21:37	65,2 KB
R1-141590.zip	2014/03/22 21:37	80,2 KB
R1-141591.zip	2014/03/22 21:37	162,1 KB
R1-141592.zip	2014/03/22 21:37	120,6 KB
R1-141593.zip	2014/03/22 21:37	74,1 KB
R1-141594.zip	2014/03/22 21:37	63,9 KB
R1-141595.zip	2014/03/22 21:38	88,3 KB
R1-141596.zip	2014/03/22 21:38	516 KB
R1-141597.zip	2014/03/22 21:38	58,4 KB
R1-141598.zip	2014/03/22 21:38	83,9 KB
R1-141599.zip	2014/03/22 21:38	21,3 KB
R1-141600.zip	2014/03/22 21:38	34,4 KB
R1-141601.zip	2014/03/22 21:38	60,3 KB
R1-141602.zip	2014/03/22 21:38	32,7 KB
R1-141603.zip	2014/03/22 21:38	30,2 KB
R1-141604.zip	2014/03/22 21:38	32,8 KB
R1-141605.zip	2014/03/22 21:38	41,2 KB
R1-141606.zip	2014/03/22 21:38	10,3 KB
R1-141607.zip	2014/03/22 21:38	31,5 KB
R1-141608.zip	2014/03/22 21:38	12,2 KB
R1-141609.zip	2014/03/22 21:38	21,6 KB
R1-141610.zip	2014/03/22 21:38	45,9 KB
R1-141611.zip	2014/03/22 21:38	38,1 KB
R1-141612.zip	2014/03/22 21:38	39 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141618.zip	2014/03/22 21:38	116,3 KB
R1-141619.zip	2014/03/22 21:38	129,9 KB
R1-141620.zip	2014/03/22 21:38	84,3 KB
R1-141621.zip	2014/03/22 21:38	133,5 KB
R1-141622.zip	2014/03/22 21:38	16,9 KB
R1-141623.zip	2014/03/21 19:50	15,4 KB
R1-141624.zip	2014/03/21 19:50	29 KB
R1-141625.zip	2014/03/22 21:38	20,4 KB
R1-141626.zip	2014/03/22 21:38	75,8 KB
R1-141627.zip	2014/03/22 21:38	135,8 KB
R1-141628.zip	2014/03/21 19:50	20,5 KB
R1-141629.zip	2014/03/21 19:50	21,5 KB
R1-141630.zip	2014/03/21 19:50	19,3 KB
R1-141631.zip	2014/03/22 21:38	20,2 KB
R1-141632.zip	2014/03/22 21:38	263,3 KB
R1-141633.zip	2014/03/22 21:38	24,9 KB
R1-141634.zip	2014/03/21 19:50	14,1 KB
R1-141635.zip	2014/03/22 21:38	30,5 KB
R1-141636.zip	2014/03/22 21:38	79,8 KB
R1-141637.zip	2014/03/22 21:38	200,1 KB
R1-141638.zip	2014/03/22 21:38	28,4 KB
R1-141639.zip	2014/03/22 21:38	34,3 KB
R1-141640.zip	2014/03/22 21:39	747,9 KB
R1-141641.zip	2014/03/22 21:39	749,9 KB
R1-141642.zip	2014/03/22 21:39	51,2 KB
R1-141643.zip	2014/03/22 21:39	42 KB
R1-141644.zip	2014/03/22 21:39	104,3 KB
R1-141645.zip	2014/03/21 19:50	69,1 KB
R1-141646.zip	2014/03/21 19:50	61,5 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141651.zip	2014/03/21 19:50	39,9 KB
R1-141652.zip	2014/03/21 19:50	34,4 KB
R1-141653.zip	2014/03/22 21:39	35,3 KB
R1-141654.zip	2014/03/22 21:39	80,8 KB
R1-141655.zip	2014/03/22 21:39	45,8 KB
R1-141656.zip	2014/03/22 21:39	64,5 KB
R1-141657.zip	2014/03/22 21:39	60,3 KB
R1-141658.zip	2014/03/22 21:39	144,1 KB
R1-141659.zip	2014/03/22 21:39	132,6 KB
R1-141660.zip	2014/03/22 21:39	18 KB
R1-141661.zip	2014/03/22 21:39	175 KB
R1-141662.zip	2014/03/22 21:39	17,9 KB
R1-141663.zip	2014/03/22 21:39	60,4 KB
R1-141664.zip	2014/03/22 21:39	59,9 KB
R1-141665.zip	2014/03/22 21:39	75,9 KB
R1-141666.zip	2014/03/22 21:39	149 KB
R1-141667.zip	2014/03/22 21:39	113,1 KB
R1-141668.zip	2014/03/22 21:39	114,9 KB
R1-141669.zip	2014/03/22 21:39	143,8 KB
R1-141670.zip	2014/03/22 21:39	28,5 KB
R1-141671.zip	2014/03/22 21:39	599,7 KB
R1-141672.zip	2014/03/22 21:39	263,7 KB
R1-141673.zip	2014/03/22 21:39	32,3 KB
R1-141674.zip	2014/03/22 21:39	58,6 KB
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R1-141677.zip	2014/03/22 21:39	27,8 KB
R1-141678.zip	2014/03/22 21:39	178,5 KB
R1-141679.zip	2014/03/22 21:39	33,6 KB
R1-141680.zip	2014/03/22 21:39	157,5 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141684.zip	2014/03/22 21:39	210,2 KB
R1-141685.zip	2014/03/21 19:50	77,5 KB
R1-141686.zip	2014/03/21 19:50	32,6 KB
R1-141687.zip	2014/03/22 21:39	26,1 KB
R1-141688.zip	2014/03/22 21:39	55,2 KB
R1-141689.zip	2014/03/22 21:39	47,2 KB
R1-141690.zip	2014/03/22 21:40	218,7 KB
R1-141691.zip	2014/03/22 21:40	24,2 KB
R1-141692.zip	2014/03/22 21:40	260,2 KB
R1-141693.zip	2014/03/22 21:40	71,9 KB
R1-141694.zip	2014/03/22 21:40	28,9 KB
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R1-141696.zip	2014/03/22 21:40	159,5 KB
R1-141697.zip	2014/03/22 21:40	89,4 KB
R1-141698.zip	2014/03/22 21:40	85,2 KB
R1-141699.zip	2014/03/22 21:40	27,7 KB
R1-141700.zip	2014/03/22 21:40	76,1 KB
R1-141701.zip	2014/03/22 21:40	72,1 KB
R1-141702.zip	2014/03/22 21:40	103,7 KB
R1-141703.zip	2014/03/22 21:40	76,4 KB
R1-141704.zip	2014/03/22 21:40	46,4 KB
R1-141705.zip	2014/03/22 21:40	105 KB
R1-141706.zip	2014/03/22 21:41	2365,7 KB
R1-141707.zip	2014/03/22 21:40	1295,2 KB
R1-141708.zip	2014/03/22 21:41	508 KB
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R1-141711.zip	2014/03/22 21:41	237,1 KB
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R1-141713.zip	2014/03/22 21:41	315,1 KB
R1-141714.zip	2014/03/22 21:41	294,2 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141717.zip	2014/03/22 21:41	16,6 KB
R1-141718.zip	2014/04/03 13:25	225,5 KB
R1-141719.zip	2014/03/27 9:55	113,6 KB
R1-141720.zip	2014/03/27 9:55	56,3 KB
R1-141721.zip	2014/03/27 9:55	82,5 KB
R1-141722.zip	2014/04/03 13:22	27,5 KB
R1-141723.zip	2014/03/27 9:55	62 KB
R1-141724.zip	2014/03/27 9:55	134,3 KB
R1-141725.zip	2014/04/03 13:25	168,1 KB
R1-141726.zip	2014/04/03 13:25	232,8 KB
R1-141727.zip	2014/04/03 13:25	180,6 KB
R1-141728.zip	2014/04/03 13:25	372,2 KB
R1-141729.zip	2014/04/03 13:24	28,8 KB
R1-141730.zip	2014/04/03 13:24	682,8 KB
R1-141731.zip	2014/04/03 13:24	31,9 KB
R1-141735.zip	2014/04/03 13:24	161,7 KB
R1-141736.zip	2014/04/03 13:25	1336,7 KB
R1-141737.zip	2014/04/03 13:24	268,3 KB
R1-141738.zip	2014/04/03 13:24	414,2 KB
R1-141739.zip	2014/04/03 13:24	100,9 KB
R1-141740.zip	2014/04/03 13:24	24,6 KB
R1-141741.zip	2014/04/03 13:24	26,7 KB
R1-141742.zip	2014/04/03 13:24	38,9 KB
R1-141743.zip	2014/04/03 13:24	25 KB
R1-141744.zip	2014/04/03 13:24	26,6 KB
R1-141745.zip	2014/04/03 13:24	66,8 KB
R1-141746.zip	2014/04/03 13:24	42,5 KB
R1-141747.zip	2014/04/03 13:24	320 KB
R1-141748.zip	2014/04/03 13:24	28,7 KB
R1-141749.zip	2014/04/03 13:24	60,5 KB
R1-141750.zip	2014/04/03 13:22	29 KB
R1-141751.zip	2014/04/03 13:24	27,8 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141754.zip	2014/04/03 13:24	26,2 KB
R1-141755.zip	2014/04/03 13:22	11 KB
R1-141756.zip	2014/04/17 14:42	13,7 KB
R1-141757.zip	2014/04/17 14:42	93,4 KB
R1-141758.zip	2014/04/07 13:12	11,1 KB
R1-141759.zip	2014/04/07 13:12	142 KB
R1-141760.zip	2014/04/07 13:12	41,6 KB
R1-141761.zip	2014/04/07 12:56	11,9 KB
R1-141762.zip	2014/04/24 7:35	1008,4 KB
R1-141785.zip	2014/04/03 13:24	26 KB
R1-141786.zip	2014/04/03 13:24	54,3 KB
R1-141787.zip	2014/04/03 13:24	25,8 KB
R1-141788.zip	2014/04/03 13:24	29,4 KB
R1-141789.zip	2014/04/03 13:24	29,1 KB
R1-141790.zip	2014/04/03 13:24	214,6 KB
R1-141791.zip	2014/04/03 13:24	26,7 KB
R1-141792.zip	2014/04/03 13:24	50,3 KB
R1-141793.zip	2014/04/03 13:22	13,6 KB
R1-141794.zip	2014/04/03 13:24	26,5 KB
R1-141795.zip	2014/04/03 13:24	26,5 KB
R1-141796.zip	2014/04/03 13:24	26,2 KB
R1-141797.zip	2014/04/03 13:24	79,5 KB
R1-141798.zip	2014/04/03 13:24	232,3 KB
R1-141799.zip	2014/04/03 13:24	76,6 KB
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R1-141801.zip	2014/04/03 13:22	41,5 KB
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R1-141804.zip	2014/04/03 13:23	26,6 KB
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R1-141806.zip	2014/04/03 13:23	27 KB
R1-141807.zip	2014/04/03 13:23	38,8 KB

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R1-141815.zip	2014/04/03 13:21	27,8 KB
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R1-141827.zip	2014/04/17 14:42	53,4 KB
R1-141828.zip	2014/04/24 7:35	52,6 KB
R1-141835.zip	2014/04/07 13:12	12,3 KB
R1-141836.zip	2014/04/03 13:23	87,8 KB
R1-141837.zip	2014/04/03 13:23	58,1 KB
R1-141838.zip	2014/04/03 13:23	25,6 KB
R1-141839.zip	2014/04/03 13:23	28,2 KB
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R1-141842.zip	2014/04/03 13:23	45,2 KB
R1-141843.zip	2014/04/03 13:23	25,2 KB
R1-141844.zip	2014/04/03 13:23	25,1 KB
R1-141845.zip	2014/04/03 13:23	19 KB
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R1-141849.zip	2014/04/03 13:23	26,4 KB
R1-141850.zip	2014/04/03 13:23	46,1 KB
R1-141851.zip	2014/04/03 13:23	58,2 KB

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R1-141870.zip	2014/04/03 13:21	55,4 KB
R1-141871.zip	2014/04/07 13:12	70,4 KB
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R1-141873.zip	2014/04/07 13:12	68,2 KB
R1-141874.zip	2014/04/07 13:12	136,9 KB
R1-141875.zip	2014/04/03 13:21	27,6 KB
R1-141876.zip	2014/04/03 13:21	59,7 KB
R1-141878.zip	2014/04/03 13:21	29,7 KB
R1-141879.zip	2014/04/03 13:21	27,8 KB
R1-141880.zip	2014/04/03 13:21	35 KB
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R1-141882.zip	2014/04/03 13:21	54,7 KB
R1-141883.zip	2014/04/07 13:12	23,2 KB
R1-141884.zip	2014/04/03 13:21	32,4 KB
R1-141885.zip	2014/04/03 13:21	12,2 KB
R1-141886.zip	2014/04/07 13:12	115,8 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-141888.zip	2014/04/07 13:12	36,9 KB
R1-141889.zip	2014/04/07 13:12	101,8 KB
R1-141890.zip	2014/04/24 7:35	34,7 KB
R1-141891.zip	2014/04/07 13:12	48,5 KB
R1-141892.zip	2014/04/07 12:58	23,1 KB
R1-141893.zip	2014/04/07 13:12	51,4 KB
R1-141894.zip	2014/04/07 13:12	115,8 KB
R1-141895.zip	2014/04/07 13:12	27,6 KB
R1-141896.zip	2014/04/07 13:12	78 KB
R1-141897.zip	2014/04/07 12:57	37,2 KB
R1-141898.zip	2014/04/17 14:43	127,8 KB
R1-141899.zip	2014/05/06 11:54	153,4 KB
TDoc_List_Meeting_RAN1#76-BIS.xlsm	2016/06/30 7:35	137,2 KB
TDoc_List_Meeting_RAN1#76-BIS.xlsx	2017/11/07 11:42	159,3 KB
TDoc_List_Meeting_RAN1#76-BIS.zip	2018/01/10 16:44	207,7 KB

760 items.

Appendix 27

3GPP TSG RAN WG1 Meeting #77 **R1-141901**
Seoul, South Korea, 19th – 23rd May 2014

Source: MCC Support

Title: Final Report of 3GPP TSG RAN WG1 #76bis v1.0.0 (Shenzhen, China, 31st March – 4th April 2014)

Document for: Approval



1

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Main facts summary

3GPP TSG WG RAN1 #76bis meeting, hosted by ZTE Corporation in Sheraton Dameisha Resort Hotel, in Shenzhen, Guangdong Province, P.R.China.
The meeting started at 9:00 on Monday 31st March and finished at 17:10 on Friday 4th April 2014.
The number of attending delegates, having signed the participants' paper list, was **245**.

The week was scheduled as follows:

- Monday: Common session on Agenda items 1, 2, 3, 4, 5, 7.1 (E-UTRA maintenance Releases up to 11), 7.2.9 (Rel-12 CRs) followed by Physical layer functionalities required for operation of Dual Connectivity (AI 7.2.5) and LTE D2D Proximity Services (AI 7.2.7.2 - D2D resource allocation mechanisms).

- Tuesday (LTE): Parallel sessions on
  - LTE TDD-FDD Joint Operation (AI 7.2.3) and LTE D2D Proximity Services (AI 7.2.7) chaired by Satoshi Nagata on one hand.
  - Low Cost & Enhanced Coverage MTC UE for LTE (AI 7.2.2) and Small Cell Enhancements (AI 7.2.4) chaired by Wanshi Chen, followed by Inter-eNB CoMP for LTE (AI 7.2.6) chaired by Matthew Baker on the other hand.
- Tuesday (HSPA): Scalable UMTS by Filtering (AI 6.6) chaired by Matthew Baker, followed by UMTS Heterogeneous Networks (AI 6.3) chaired by Carmela Cozzo from Huawei.

- Wednesday (LTE): Parallel sessions on
  - Study on NAICS (AI 7.2.8) followed by Small Cell Enhancements (AI 7.2.4) chaired by Satoshi Nagata on one hand.
  - Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation (AI 7.2.1) chaired by Wanshi Chen, followed by LTE D2D Proximity Services (AI 7.2.7) chaired by Matthew Baker on the other hand.
- Wednesday (HSPA): DCH Enhancements (AI 6.2) chaired by Karri Ranta-aho from NSN, followed by Enhanced Broadcast of System Information (AI 6.5) chaired by Carmela Cozzo from Huawei

- Thursday (LTE): Parallel sessions on
  - Physical layer functionalities required for operation of Dual Connectivity (AI 7.2.5), Small Cell Enhancements (AI 7.2.4), LTE TDD-FDD Joint Operation (AI 7.2.3), and Small Cell Enhancements (AI 7.2.4) chaired by Satoshi Nagata on one hand.
  - LTE Device to Device Proximity Services (AI 7.2.7) and Inter-eNB CoMP for LTE (AI 7.2.6) chaired by Matthew Baker, Low Cost & Enhanced Coverage MTC UE for LTE (AI 7.2.2) chaired by Wanshi Chen on the other hand.
- Thursday (HSPA): Further EUL Enhancements (AI 6.4) and DCH Enhancements (AI 6.2) chaired by Karri Ranta-aho from NSN.

- Friday morning: Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation (AI 7.2.1) chaired by Wanshi Chen followed by Small Cell Enhancements (AI 7.2.4) chaired by Satoshi Nagata.
- Friday afternoon: Revisions

The list of action points that required RAN1 close follow-up is listed in Annex F (end of document).

The number of contribution documents for this meeting was 757, and those documents were categorized as followed.

Agenda Item	Input Document	Discussed Document
AI 4 to 7.2.9	754	298

Note: The amount of documents includes those discussed during the email discussion session post meeting.

3GPP TSG RAN WG1 Meeting #77 **R1-141901**
Seoul, South Korea, 19th – 23rd May 2014

1 Opening of the meeting

Mr Satoshi Nagata (RAN1 Chairman) welcomed the participants of the RAN WG1 76th bis meeting and opened the meeting at 09:00.
Mr Zhisong Zuo from ZTE welcomed the delegates on behalf of the host, ZTE Corporation and detailed the domestic arrangements for the full week.

1.1 Call for IPR

The Chairman drew the attention to Members' obligations under the 3GPP Partner Organizations' IPR policies. Every Individual Member organization is obliged to declare to the Partner Organization or Organizations of which it is a member any IPR owned by the Individual Member or any other organization which is or is likely to become essential to the work of 3GPP.

The attention of the members of this Technical Specification Group is drawn to the fact **that 3GPP Individual Members have the obligation** under the IPR Policies of their respective Organizational Partners to **inform their respective** Organizational Partners **of Essential IPRs they become aware of**.
The members take note that they are hereby invited:
- to investigate in their company whether their company does own IPRs which are, or are likely to become Essential in respect of the work of the Technical Specification Group.
- to notify the Director-General, or the Chairman of their **respective** Organizational Partners, of all potential IPRs that their company may own, by means of the IPR Statement and the Licensing declaration forms (e.g. see the ETSI IPR forms http://webapp.etsi.org/Ipr/).

1.2 Network usage conditions

The PCG has laid down the following network usage conditions:

Users shall not use the network to engage in illegal activities. This includes activities such as copyright violation, hacking, espionage or any other activity that may be prohibited by local laws.

Users shall not engage in non-work related activities that consume excessive bandwidth or cause significant degradation of the performance of the network.
Since the **network is a shared resource**, users should exercise some basic etiquette when using the 3GPP network at a meeting. It is understood that high bandwidth applications such as downloading large files or video streaming might be required for business purposes, but delegates should be strongly discouraged in performing these activities for personal use. Downloading a movie or doing something in an interactive environment for personal use essentially wastes bandwidth that others need to make the meeting effective. The meeting chairman should remind end users that the network is a shared resource; the more one user grabs, the less there is for another. Email and its attachments already take up significant bandwidth (certain email programs are not very bandwidth efficient). In case of need the chair can ask the delegates to restrict IT usage to things that are essential for the meeting itself.

1. DON'T place your WiFi device in ad-hoc mode
2. DON'T set up a personal hotspot in the meeting room
3. DO try 802.11a if your WiFi device supports it
4. DON'T manually allocate an IP address
5. DON'T be a bandwidth hog by streaming video, playing online games, or downloading huge files
6. DON'T use packet probing software which clogs the local network (e.g., packet sniffers or port scanners)

2 Approval of Agenda

R1-141100	Draft Agenda for RAN1#76bis meeting	RAN1 Chairman	

Satoshi Nagata (Chairman) proposed the agenda for the meeting, as well the schedule of the week.
Decision: The agenda is approved.

3 Approval of Minutes from previous meeting

R1-141730	Final Report of RAN1#76 meeting	MCC	(R1-141101)

The document was presented by Patrick Mérias (ETSI Mobile Competence Center) and provides the outcomes of last meeting in Prague. Only difference with R1-141101 is to reflect correct conclusion of email discussion [76-04] on periodic CSI for eIMTA.
Discussion: MCC reminders: don't forget when submitting a TR to plenary to attach the mandatory presentation template.
Regarding email reflector collapse, remember to only attach zipped files to emails.
Decision: The agenda is approved.

4 Highlights from RAN Plenary

R1-141102	Highlights from RAN#63	RAN1 Chairman	

The document was presented by Satoshi Nagata (Chairman) and provides the outcomes of last plenary meeting relevant to RAN1.
Discussion: MCC comments

- Study on LTE Device to Device Proximity Services - TR36.843 approved as v12.0.0 – cleaned-up by MCC as v12.0.1
- Study on Network-Assisted Interference Cancellation and Suppression for LTE - TR36.866 approved as v12.0.0 – cleaned-up by MCC as v12.0.1
- Study on 3D-channel model - No Time Unit (TU) allocated in Q2-2014 (RAN1#76bis and #77), but allocate RAN1 TU in RAN1 #78 → this decision results in completion date by Sept while SID still mention June 2014. Rapporteur Nokia will check.

Decision: The document is noted.

5 Incoming Liaison Statements

R1-141112	LS on GCSE QCIs and connected mode DRX	SA2, Vodafone	= S2-140846

The document was presented by Eric Bouton from Vodafone and states that the Group Communication services solution permits both the use of unicast bearers and eMBMS, and its scope is not limited to only Public Safety users. SA2 believes that some of the unicast bearers will have different characteristics to those provided by existing QCIs and anticipates the need to add one or more new QCIs to TS 23.203. An initial draft of potential changes to TS 23.203 has been included in an annex to TR 23.768 and is attached in S2-140829.
Discussion: Mr Chair→Is RAN1 feedback needed? No need according to Ericsson
Decision: The document is noted. No reply LS to SA2.

R1-141113	LS on Provisioning of ProSe configuration information in a public safety ProSe enabled UE	SA2, Deutsche Telekom	= S2-140847

The document was presented by Georg Wannemacher from Deutsche Telekom and asks RAN1 to take note of the assumption on the radio resource parameters used by the UE made by SA2.

- If both the UICC application and the ME contain the same provisioning parameters, the parameter values from the UICC shall take precedence.

NOTE: when radio parameters (to be used when the UE is not served by E-UTRAN) are configured in the UICC it is not possible to use any radio resource parameters that may have been provided to the ME at an earlier time while in coverage.
Discussion: No special action required during D2D sessions.
Decision: The document is noted.

R1-141115	Discussion on discovery message size	Huawei, HiSilicon	

The document was presented by Philippe Sartori from Huawei and deals with LS reply from SA2 on discovery message size, considering discovery information sizes of around 200 bits that may result in unnecessary burden on the air interface. It is concluded that for an effective D2D discovery, the number of bits transmitted over the air in a discovery message should be kept low, around 100 bits as previously assumed, or even lower if possible.
Decision: The document is noted.

R1-141114	[DRAFT] LS on discovery message	Huawei, HiSilicon	

Discussion: LGE proposed sending LS both to RAN2 and SA2 (action point to SA2 to consider the discovery message based on RAN1 input).
Qualcomm/ALU/CATT don't believe such an LS is needed.
Decision: The document is noted. Offline discussion and revisit on Friday, taking into account the following:

- Change SA2 from "CC" to "To"
- Add action point to SA2 as "RAN1 asks SA2 to consider to reduce the discovery message based on RAN1 input

Friday 4th : Draft LS is for email discussion until 15th April - Huawei

R1-141106	LS on RACH Aspects with eIMTA	RAN2, CATT	= R2-141007

The document was presented by Xueming Pan from CATT and provides RAN2 feedback on RACH aspects with eIMTA, including the intended UE behaviour in RACH procedure and the possible recommendations to eNB implementation to avoid issues such as uplink to downlink interference, etc..
Decision: The document is noted and RAN2 agreements will be taken into consideration in Rel-12 CRs drafting phase.

R1-141421	Impact of RACH procedure to TDD eIMTA reconfiguration	ZTE	

The document was presented by Zhisong Zuo from ZTE and gives further analysis of impacts between RACH procedure and TDD eIMTA reconfiguration.
Discussion: CATT agreed that some limitations do exist but still believes that RAN1 should follow the RAN2's view.
Decision: The document is noted.

R1-141103	LS on improvements to EUL coverage by TTI switching	RAN2, Ericsson	= R2-140891

The document was presented by … from Ericsson and states that the decision to trigger the (2ms to 10ms or 10ms to 2ms) TTI switch can be taken autonomously by the serving Node B or by the RNC. In the case that the RNC makes the decision, the RNC will then need to inform the serving Node B of this decision.
In both cases, whether the RNC or Node B makes the decision to switch the TTI, the serving Node B will inform the UE to perform the TTI switch via a new Layer 1 HS-SCCH order.
RAN2 did not conclude how the non-serving Node Bs would be notified of the decision to switch TTI.
Decision: The document is noted. To be taken into account during Further EUL enhancements session.

R1-141104	Reply LS on LTE coverage enhancement	RAN2, ZTE	= R2-141003

The document was presented by Zhisong Zuo from ZTE and informs RAN2 agreement to introduce one parameter called *e-HARQ-Pattern* which will be used to enable the enhanced HARQ pattern for TTI bundling for FDD. Enhanced TTI bundling will be only enabled when both this parameter and existing *ttiBundling* parameter are set to TRUE.
In addition RAN2 also agreed to define one UE capability bit to indicate whether the UE can support enhanced HARQ.pattern for TTI bundling.
Discussion: The LS states that the new parameters are listed in the attachment, but attachment is missing. Attachment concerns 2 CRs to TS36.331 (R2-141001) and to TS36.306 (R2-141002 further replaced by RP-140415 because R2-141002 was based on the wrong spec version) postponed by RAN#63 in order to wait for RAN1 CRs and to approve them together ”
Content of these two CRs can still be considered by RAN1 for further study.
Decision: The document is noted.

R1-141105	Reply LS to S2-133846 = R2-133066 on GCSE with eMBMS	RAN2, Huawei	= R2-141004

The document was presented by David Mazzarese from Huawei and provides answers related to the service continuity, issues related to eMBMS operations and concludes that RoHC is not required to be supported for GCSE over eMBMS.
Discussion: No action required from RAN1.
Decision: The document is noted.

R1-141107	Liaison to 3GPP RAN, RAN1 and RAN3 on consolidated operator view on eCoMP standardization	NGMN Project RAN Evolution, CMCC	

The document was presented by … from CMCC and states that a clear majority of NGMN operators expects that 3GPP will continue the WI of CoMP-NIB and try to complete the standardization of CoMP-NIB in Release 12. 3GPP can consider converged signalling supporting both centralized and distributed coordination. Signalling of raw measurement information (CSI, RSRP) to the coordinator is recommended, at least for the centralized case.
Decision: The document is noted.

R1-141108	LS on deployment scenario for Intra-band Non-contiguous CA	RAN4, NTT DoCoMo	= R4-140596

The document was presented by Fred Takeda from NTT DoCoMo and shows RAN4 conclusion that deployment scenario for Intra-band Non-contiguous CA has both co-located scenario and non-co-located scenario. This conclusion is for downlink CA only.
Discussion: No action required from RAN1.
Decision: The document is noted.

R1-141109	Reply LS on half duplex FDD operation for Low complexity MTC UE	RAN4, Huawei	= R4-141235

The document was presented by Brian Classon from Huawei and states that:

- For low complexity HD-FDD MTC UE, the Rx-to-Tx switching time is up to 1ms if single oscillator is used
- For low complexity HD-FDD MTC UE, the Tx-to-Rx switching time is up to 1ms if single oscillator is used
- The definitions of Tx-to-Rx and Rx-to-Tx guard period need to be clarified in TS36.211 for low complexity HD-FDD MTC UE.

Decision: The document is noted. To be taken into account during Low cost MTC sessions.

R1-141110	LS on BS classes and maximum BS power on 256QAM	RAN4, Huawei	= R4-141254

The document was presented by Ms Xia Yuan from Huawei and asks RAN to make a decision on BS classes and maximum BS power in support of 256QAM.
Discussion: No action required from RAN1.
Decision: The document is noted.

R1-141111	Reply LS to R4-141254 = RP-140024 on BS classes and maximum BS power on 256QAM	RAN, Huawei	= RP-140510

The document replies that the current scope of Small Cell Enhancements WI does not exclude Medium Range BS from small cell scenario. The study in RAN1 [TR 36.872 v12.1.0] covers the BS output power larger than 24dBm up to 30dBm. The requirements

studies and work for 256QAM for medium range BS will start once the requirements for Local Area BS and Home BS have been finalized.
Decision: The document is noted.

5.1 Incoming LS received during RAN1#76bis

R1-141862	Resource allocation restriction and identification of low complexity MTC Ues	RAN2, Vodafone	= R2-141825

The LS is treated under AI 7.2.2.1

Not treated.

R1-141835	LS on parameter synchronization	SA3, Qualcomm	= S3-140566

5.1.1 Enabling high user bitrates in a mixed-traffic scenario

5.1.1.1 DTX/DRX enhancements including improved power control

R1-141673	Further considerations on DTX enhancements	Huawei, HiSilicon	

Proposal 1: Sync procedure is removed with DC-HSUPA when the secondary carrier is activated.
Proposal 2: Infinity DTX cycle is not supported for DTX/DRX enhancement.
Decision: The document is noted.

R1-141690	On the DTX Parameterization for Secondary Carriers	Ericsson	

Proposal 1: Decide on which proposal (1. Extending the DTX cycle 2 (Infinite), 2. Extending the DTX cycle 2 (Numeric Value), 3. Transmit DPCCH only together with E-DPCCH/E-DPDCH) should be added to the uplink DTX operation of the secondary carriers.
Decision: The document is noted.

R1-141713	Details of DTX/DRX Improvements	Qualcomm Incorporated	

Proposal 1: Adopt the extended DTX cycle 2 parameters in Table 1, if Sync A procedure is not required and if power control issues are adequately addressed.
Proposal 2: Adopt timer based de-activation of secondary carriers in single and dual-Band HSDPA
Proposal 3: Adopt DRX cycle 2 and an inactivity threshold for cycle 2 operation and the corresponding values shown in Table 3 for single carrier.
Decision: The document is noted.

Agreements on uplink DTX for the secondary uplink carrier with DC-HSUPA

- The DTX cycle 1, DTX cycle 2 and the inactivity threshold for cycle2 can be configured to be different for the secondary carrier than for the primary
- The secondary carrier DTX cycle 2 values are extended with the following values, proposed values as below:
  - 2ms TTI: up to 1280 TTIs
  - 10ms TTI: up to 320 TTIs, if DC-HSUPA with 10 ms TTI is allowed by RAN2

R1-141691	On Increasing the DRX Cycle for Single and Multicarriers	Ericsson	

Proposal 1: Introduce an UE DRX cycle 2 along with an Inactivity Threshold for UE DRX cycle2.
Proposal 2: Extend the length of the UE DRX cycle 2 at least up to 80 subframes.
Decision: The document is noted.

R1-141674	Further considerations on DRX enhancements	Huawei, HiSilicon	

Proposal 1: DRX decoupling is not supported in DC-HSDPA case.
Proposal 2: DRX cycle is not extended if DRX decoupling is introduced in DB-HSDPA case.
Decision: The document is noted.

Agreements for downlink DRX

- Single-carrier HSDPA case
  - Introduce a second (longer) DRX cycle with a longer inactivity threshold
    - 2nd inactivity threshold values shall use the same set as the current DRX inactivity threshold values.
    - 2nd DRX cycle values : {4, 5, 8, 10, 16, 20, 32, 40, 64, 80}
- Multicarrier HSDPA case
  - Autonomously deactivate the secondary carrier after the 2nd inactivity threshold is reached (instead of moving to 2nd DRX cycle)

- If the 2nd inactivity threshold has been reached, only the primary carrier can be used to transmit data to the UE during the 2nd DRX cycle on periods, and when data is received, reception on all carriers is resumed.
- The inactivity timer is common to all DL carriers, i.e. reset when HS-SCCH is received on any of the DL carriers.
- The above behavior is applicable to all secondary HS-DSCH carriers, regardless of whether they are on the same band as the primary HS-DSCH carrier or on a different band

Note: It is RAN1's understanding that for some UE receiver implementations it is beneficial for current consumption to be able to not monitor at least some control channels on one carrier even if adjacent carrier is in use.

R1-141661	LLS results for DTX Power Control with Long DTX Cycles	NSN	

Proposal: not introduce any modifications of the power control algorithm related to a support of long DTX cycles.
Decision: The document is noted.

R1-141693	On Improving the Power Control for Secondary Carrier after Transmission Gap	Ericsson	

Proposal 1: Adopt the presented algorithm to improve power control for the secondary carrier after DPCCH transmission gaps.
Decision: The document is noted.

R1-141714	Power Control Performance due to Long DTX/DRX Cycles	Qualcomm Incorporated	

The variable PC step approach brought the performance improvement in PA3. Under single user scenario 4-5 preambles may be needed. In these simulations, multiuser scenarios and corresponding interferences due to multiple users are not modelled. The interference impacts on power control using preamble need to be studied further.
Decision: The document is noted.

Conclusions:
- For DC-HSUPA with longer DTX gaps on the secondary carrier than on the primary carrier it is expected that at least in some cases to be beneficial to derive the initial DPCCH transmission power of the secondary carrier from filtered primary carrier DPCCH power.
- Evaluation scenario to be agreed over email by April 10th, and the decision is to be taken in RAN1#77 based on further evaluation. The scenario should be suggested no later than Tuesday 8th of April. Peter/Ericsson

R1-141675	Considerations on transmitting F-DPCH for the secondary carrier on the primary carrier	Huawei, HiSilicon	

Proposal 1: F-DPCH for the secondary carrier is transmitted on the primary carrier for FEUL enhancement.
Decision: The document is noted.

Conclusions:
- Following potential implications have been identified and should be verified:
  - All DL control channels should be moved to the primary carrier
  - The secondary carrier sync maintenance would not be done
  - The secondary active set maintenance (from which cells to receive the DL control for the secondary uplink) would need to be based on the primary carrier
  - The implications of deactivating the secondary downlink while maintaining secondary uplink
- The benefit of improved DL power control (due to higher UL DPCCH activity on the primary carrier) should be demonstrated. The same scenario that is to be decided for the uplink power control improvements can be used for evaluation of the DL power control change benefit.

5.1.1.2 Improved granting

R1-141659	HARQ Solutions for TDM operation	NSN	

Proposal 1: The network can configure UEs to either follow the legacy HARQ operation (prioritize retransmissions) or use one of the solutions.
Proposal 2: A UE can be configured not to perform retransmissions automatically if the Serving Grant is set to Zero or Inactive but to hold a packet in the buffer until it receives a Serving Grant again. Additionally, the UE can be configured to inform the network about a retransmission need by sending Scheduling Information if it is in the Soft Handover.
Proposal3: A UE can be configured to discard pending retransmissions and flush HARQ buffers if it was signalled a Zero_Grant or Inactive and leave the higher layers to perform the retransmission.
Decision: The document is noted.

R1-141722	Solution for improved grant handling for TDM operation	NSN, Huawei	(R1-141660)

Proposal 1: The new behaviour is only applicable with 2 ms TTI
Proposal 2: The UE can be configured with two E-AGCH code channels
Proposal 3: If the E-AGCH carries an explicit "Zero_Grant", or if it carries an explicit "Inactive" with Absolute Grant Scope of "All HARQ processes", the UE takes action 1 TTI faster than defined in Rel-6
Proposal 4: One of the two E-AGCHs operates in 'grant detection mode'
If the UE detects that there was a transmission on this E-AGCH but it's CRC decoding fails (some other UE's E-RNTI was used), and the current SG was received on this E-AGCH code channel, the UE considers this as Zero_Grant. In this case the Rel-6 timing applies.
Proposal 5: If UE is configured with only one E-AGCH then it is network dependent whether behaviour described in Proposal 3 or Proposal 4 is configured

Decision: The document is noted.

R1-141692	Comparative Analysis of TDM Scheduler Schemes for Secondary Carriers	Ericsson	

Proposal 1: Take into consideration the analysis presented in this paper when selecting a solution for the TDM operation.

Decision: The document is noted.

Working assumption:

- The UE is required to monitor only one E-AGCH code per cell (i.e. with DC-HSUPA one on primary and one on secondary carrier)
  - Verify that multiuser scheduling is possible, or the working assumption needs to be revisited.
- E-AGCH grant detection (UE considers a transmitted E-AGCH with incorrect CRC as Zero_Grant) as a possible configuration for one E-AGCH
- It is RAN1's understanding that no new RAN4 UE performance requirement is needed. RAN4 to confirm.
- The HARQ retransmission handling to be decided in RAN1#77

With regards to the E-AGCH grant detection, the behavior related to UE DRX and not monitoring the E-AGCH channel should be reviewed.

Objectives for the HARQ retransmission handling solution:

- Avoidance of colliding retransmissions of one user with new transmissions of another user

6 UTRA

R1-141759	Chairpersons' summary of the UMTS sessions	UMTS Session Chairpersons (Karri Ranta-aho, NSN, Carmela Cozzo, Huawei, Matthew Baker, Alcatel-Lucent)	

The document was presented by Chairpersons.

Decision: The document is endorsed and incorporated below, including updates on Way Forward on DCH Enhancements.

6.1 Maintenance of UTRA Releases 4 – 11

6.1.1 FDD

None

6.1.2 TDD

None

6.2 DCH Enhancements

WID in RP-131357. The enhancements are intended to target AMR voice over DCH, and/or SRB over DCH (where applicable.)

6.2.1 DL transport channel processing and multiplexing

None

6.2.2 DL control channel design

None

6.2.3 UL transport channel processing and multiplexing

R1-141491	UL DCH Enhancement solution comparison	MediaTek Inc.	

- UL FET scheme provides about 0.17 dB link gain on the uplink and introduces about 0.18 dB link loss on the downlink.
- UL FET scheme needs specification changes and UL FET-less scheme does not need such a change
- for UL FET operation, Node B needs multiple decoding attempts and for UL FET-less operation, node B only needs one time decoding
- There is a need to change DL control channel structure in order to achieve UL FET and there is no change required for DL control channel if UL FET-less scheme is adopted.

Decision: The document is noted.

R1-141492	System simulation results for uplink FET-less transmission mode switching	MediaTek Inc.	

It is shown that the probability that the UE with power class either 23 dBm or 24 dBm exceeds the maximum allowed value is very small – less than 2%. Even for UE with maximum TX power of 20 dBm, the likelihood is less than 4%. Hence it may be better to use high layer signalling for uplink UE transmission mode switching indication.

Decision: The document is noted.

R1-141700	Mechanisms for UL 10ms/20ms TTI switching	Qualcomm Incorporated	

Proposal 1: A TFC shall not use 10ms transmission in a TTI if at least two transport channels have different TTI values.
Proposal 2: A TFC shall not use 10ms transmission in a TTI if the TTI overlaps in time with a compressed-mode gap.
Proposal 3: A state attribute for each transport format combination tracks whether 10ms transmission is applicable for that TFC or not, on a per TTI basis.
Proposal 4: If 10ms transmission should be used for a given transport block, physical layer transmits the transport block over the first radio frame assuming the TTI is 10ms, and blanks the subsequent radio frames of the TTI.
Proposal 5: A state machine is introduced to maintain, for each TFC, two states, a 10ms state and a 20ms state.
Proposal 6: The transition between 10ms state and 20ms state is based on estimated UE transmit power using DPDCH and DPCCH gain factors corresponding with 10ms physical-layer TTI configuration and 20ms physical layer configuration.
Proposal 7: The network signals K, L, M parameters that control the transition dynamics of the physical-layer TTI adaptation state machine.

Decision: The document is noted.

Conclusion:

- UE based adaptation between 10 and 20 ms transmission mode using MAC/Phy layer is used
- The parameterization gives the RNC the possibility to configure the UE to always use 10 or 20 ms mode

6.2.4 UL control channel design – boosting/repetition of FET-ACK

R1-141494	UL ACK design comparison for DL-FET	MediaTek Inc.	

Proposal: It is proposed that uplink ACK/NACK is sent by repetition of ACK symbols.

Decision: The document is noted.

R1-141668	Consideration on UL ACK for DL Frame Early Termination	Huawei, HiSilicon	

Proposal: Uplink ACK/NACK for DL FET is sent by repetition of ACK symbols.

Decision: The document is noted.

R1-141701	Design of UL DPCCH ACK channel for DL FET	Qualcomm Incorporated	

Proposal 1: ACK shall be sent in pairs over consecutive pairs of slots starting from slot number 10 with a total of 8 ACK opportunities every 20ms, i.e., over slot pairs (10,11), (12,13),…,(24,25) (where slots in a TTI are numbered 0 through 29).
Proposal 2: TFCI shall have 32 possible values and encoded using (20,5) Reed Muller code specified in Table 15A of Section 4.7.2.2 of TS25.212.

Decision: The document is noted.

R1-141495	Uplink TFCI coding considerations	MediaTek Inc.	

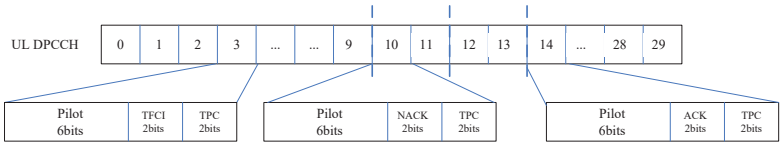
Proposal: Keep the legacy R99 (32, 10) RM codes and apply the first 20 bits of each (32, 10) codeword for TFCI transmission as the DCH enhancements solution.

Document not treated.

Conclusion on FET-ACK transmission in uplink:

- FET-ACK field is always sent with the same content across two consecutive slot
- The slot pairs are fixed (10,11), (12,13),…,(28,29) as in the figure below

- If the UL DPCCH transmission continues after DL FET is terminated and the first pair of slots with ACK have been sent, the ACK is repeated until the uplink DPCCH transmission of that TTI ends.
- Operation during compressed mode is FFS



Working assumption on TFCI encoding

- The existing TFCI encoding using (32,10) code is used, and the first 20 bits are transmitted in the first 10 slots of the UL DPCCH TTI. The code words to be used are 0,1,2,…,N, where the N is the maximum number of TFCs -1.
- MSB of the TFCI is used to indicate whether 10 ms or 20 ms transmission mode is used in the TTI

6.2.5 Other

R1-141703	UE capabilities and sub-feature dependencies for DCH enhancements	Qualcomm Incorporated	

Proposal 1: The network signals an early DL BLER target and an early BLER target slot to the UE, in addition to overall BLER target, to control how fast the UE can decode the DL transport block.
Proposal 2: A basic UE capability and network configuration is provisioned for DCH enhancements where only UL DPDCH dynamic 10ms transmission, DL class A,B,C concatenation, pilot-free slot format, pseudo-flexible rate matching, and early BLER target sub-features are required.
Proposal 3: A full UE capability and network configuration is provisioned for DCH enhancements where all the sub-features in addition to basic capability are supported to provide full benefit of DCH enhancements.
Proposal 4: The only two network configurations and UE capabilities to be used for DCH enhancements are the basic UE capability and network configuration, and full UE capability and network configuration.

Decision: The document is noted.

R1-141704	DCH Enhancements and CPC	Qualcomm Incorporated	

Proposal 1: CPC can be enabled together with DCH Enhancements.
Proposal 2: When configured with DCH enhancements, UE is allowed to DTX/DRX DPDCH channels, independent of CPC configuration.
Proposal 3: UE applies DTX/DRX of all channels in a slot if, and only if, such DTX/DRX application is allowed in that slot by both the rules of CPC and those of DCH-Enhancements.

Decision: The document is noted.

Come back during RAN1 main session
Friday 4th

R1-141760	Way Forward on Aspects of DCH Enhancements	Qualcomm, MediaTek	

The document was presented by Peyman Razaghi from Qualcomm.
Decision: The document is noted and modified as follows:

Agreements for UL 10ms transmission in normal mode:

- In a 20ms speech frame that contains only DTCH transport blocks (DCCH is not present):
  - A TTI value of 10ms shall be used to send the DPDCH transport blocks in the first radio frame.
  - DPDCH in the second 10ms radio frame shall be DTXed.

Remaining issues are for email discussion until April 24th – Qualcomm – , including:

- UL phy-layer behavior in a 20ms TTI that contains both DTCH and DCCH transport blocks.
- Details of 10ms transmission of DTCH/DCCH transport blocks in UL compressed mode.
- UE capabilities.
  - DL early BLER target
- UL dynamic 10ms transmission selection shall be disallowed during compressed frame transmissions, and 20 ms mode is always used.
- R1-141704

R1-141705	Remaining Aspects of DCH Enhancements	Qualcomm Incorporated	

Decision: The document is noted.

Agreements:

- Uplink DCH-Enhancements mode: Agree to specify the design assuming UL operation without UL FET. Leave for further study whether to also specify a mode allowing UL FET.
- Interpretation of Ack/Nack: UE signals Ack on UL when all transport blocks transmitted being transmitted on DL DPCH are decoded successfully with CRC-pass.
  - The Ack sent on UL indicates successful decoding of all such transport blocks with a TTI during which UL Ack transmission was started. I.e. in case of simultaneous DCCH and DTCH transmission, UL Ack is only sent when both DCCH and DTCH TBs decode correctly
- 16-bit CRC is always used in the downlink
- PO2 (DPDCH/TPC) offset signaling is mandatory for the DL. Signalling of PO2 should be per radio link as is the case in Rel'99 (Power offset $P_{TPC\text{-}DPDCH}$ in IE "Downlink DPCH info for each RL" in TS25.331~~TBC~~)
- A different power offset PO2' is applied during DL DCCH transmissions and the offset used is mandatorily signaled per radio-link to the UE.
- The range of allowed values for both these power offsets is 0 to 6dB in steps of 0.25dB (as for existing signaling of PO3).
- UL CLTD can be enabled together with DCH Enhancements. UL S-DPCCH is DTXed whenever UL DPCCH is DTXed. F-TPICH is DRXed if the TPC sent on DL in the same slot is DRXed.
- Pseudo-flexible RM is defined as using fixed-positions RM with RM attribute that could vary across TTIs for any TrCh with TTI equal to the maximum TTI among all TrChs in the CCTrCh. For each of these TrChs, the RM attribute is set to zero whenever no transport block is delivered on that TrCh.
- The enhanced DCH operational timeline is characterized as:
  - UE must always transmit TFCI in the first 10 slots of every 20ms TTI duration
  - If a UL transport block is transmitted over both radio frames (20 ms transmission), UE does not DTX or DRX
  - If UL TFC does not include any transport block (eg Null without CRC and without DCCH), then UE DTXes the uplink after sending Ack
  - If UL TFC is transmitted with 10ms transmission, and carries at least one transport block, then UE must transmit for at least the first radio frame, and after that will DTX once Ack has been sent on uplink
  - UE begins DRX in the same slot that DTX of entire uplink begins. Note that NodeB may still send DL DPCCH a few slots after UE has sent the Ack and DTXed the UL, depending on NodeB Ack processing delay, however since UE has already DTXed, the UL-TPC commands that NodeB sends in those slots can be ignored.
  - Neither the UE nor the Node B transmit any warm-up slots after the gap prior to the next TTI start.

R1-141490	Downlink compressed mode considerations	MediaTek Inc.	

We think the methods for R99 DL compressed mode operation can be extended for DL DCH enhancement usage if there are no significant DL DPCCH format changes. However, if an additional UL-FET mode is adopted which needs new DL control and signalling designs, there may require significant DL compressed mode changes for DCH enhancements.

Decision: The document is noted.

R1-141493	Uplink compressed mode design for DCH enhancements	MediaTek Inc.	

- Proposal 1: UL TFCI shall be transmitted in the first available 10 slots (excluding TG slots) within two consecutive radio frames in compressed mode.
- Proposal 2: In compressed mode, if the last slot number index at the end of a speech frame transmission is N, where *, then:
  - If ACK needs to be transmitted at or before slot number N-1, ACK shall be transmitted continuously until slot number N.
  - If ACK needs to be transmitted at slot number N, in addition to the ACK command transmission at slot N, one more non-TG slot with ACK shall be transmitted
  - If ACK needs to be transmitted after slot number N, first two available non-TG slots with ACK command shall be transmitted.

*Within two consecutive radio frames, the first slot index is defined to be zero and the last slot index is 29

- Proposal 3: For UL FET-less operation, if in NM, the UL DPDCH speech frame is transmitted in 10 ms TTI (15 slots) and UE is commanded to enter CM, UE shall employ the same speech format – 15 slots within two radio frames, UL DPDCH shall be transmitted in the first available 15 slots within two consecutive radio frames, and it may be transmitted across the TG. There are no power changes required for NM and CM.
- Proposal 4: For UL FET-less operation, if in NM, the UL DPDCH speech frame is transmitted in 20 ms TTI (30 slots) and UE is commanded to enter CM, UE shall follow the current R99 time reduction methods to transmit the UL DPDCH

- Proposal 5: For UL FET-less operation, in CM, if UE is commanded or has decided to switch to 10 ms TTI, the UE UL DPDCH shall follow the transmission method in CM as stated in proposal 3; if UE is commanded or has decided to switch to 20 ms TTI, the UE UL DPDCH shall follow the transmission method in CM as stated in proposal 4.
- Proposal 6: In NM and CM, Node B may always decode DPDCH once at the end of 20ms TTI.
- Proposal 7: In NM and CM, Node B shall terminate DL DPDCH transmission after UL DPCCH ACK command is received. Meanwhile, Node B shall terminate DL DPCCH transmission after UL DPCCH ACK command is received and after UL DPDCH speech frame is received.

Decision: The document is noted.

R1-141657	Compressed mode for enhanced DCH	NSN	

- Proposal 1: Discuss whether the enhanced DCH should be integrated with Compressed Mode (CM), or whether the system could rely on fall-back to Rel'99 when CM is needed for measurement gap generation.
- If the decision is to support enhanced DCH with CM we propose the following design constraints for CM:
- Proposal 2: A CM pattern with 14-slot gap and pattern length of N*20 ms is the only supported configuration, where the N is an integer multiplier configured by the network.
- Proposal 3: the CM gap is generated by freezing FET on TTIs with the CM gap, and transmitting
  - 10 ms UL DPDCH voice frame always, even if the UE is power limited
  - 16 slots UL DPCCH always, The FET-ACK field could be fixed to NACK to aid channel estimation, or it could operate normally.
  - 16 slots of DL DPDCH always, a SIR target offset and power boost may be applied in the TTIs with the CM gap.

Decision: The document is noted.

R1-141702	Compressed Mode Aspects of DCH Enhancements	Qualcomm Incorporated	

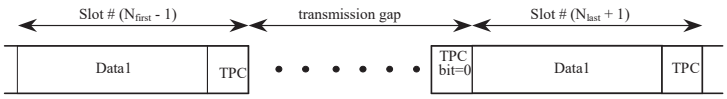
Proposal 1: Pseudo-flexible RM in compressed mode behaves the same as Pseudo flexible RM in non-compressed mode.
Proposal 2: Transmission of Ack channel for DL FET is allowed during compressed mode.
Proposal 3: For the new pilot-free slot formats, their corresponding compressed-mode 'A' and 'B' slot-formats are also pilot-free, as defined in Table 1.
Proposal 4: In compressed mode, the new pilot-free slot-formats always use a modified form of frame-structure 'A'. As shown in Figure 1, the modification consists of replacing the pilot transmitted in the last slot of the compression gap by aTPC command. This TPC command is set to a fixed value of 0 and not used by the UE for the purpose of UL power control.
Proposal 5: UL dynamic 10ms transmission selection shall be disallowed during compressed frame transmissions. UL DPCCH slot format does not change in compressed mode frames. TFCI is transmitted in the first 10 slots that do not fall in the compressed-mode transmission gap. Other aspects of compressed mode operation are similar to R99 compressed mode. No change is made to the currently allowed choices of compressed-mode parameters such as transmission gap length etc.
Proposal 6: To ensure successful delivery of TFCI information, the first 10 slots of UL DPCCH that do not fall in the compressed-mode transmission gap are always transmitted, regardless of UL DPCH gating opportunities.

Decision: The document is noted.

Agreements on downlink compressed mode for enhanced DCH

- Pseudo-flexible RM in compressed mode behaves the same as Pseudo flexible RM in non-compressed mode.
- Transmission of Ack channel for DL FET is allowed during compressed mode.
- For the new pilot-free slot formats, their corresponding compressed-mode 'A' and 'B' slot-formats are also pilot-free, as in the table below:
- In compressed mode, the new pilot-free slot-formats always use a modified form of frame-structure 'A'. As shown in Figure below, the modification consists of replacing the pilot transmitted in the last slot of the compression gap by a TPC command. This TPC command is reserved and set to a fixed value of 0 in this release, and not used by the UE for the purpose of UL power control.

Slot Format #i	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/ Slot	DPDCH Bits/Slot		DPCCH Bits/Slot			Transmitted slots per radio frame N_{Tr}
					N_{Data1}	N_{Data2}	N_{TPC}	N_{TFCI}	N_{Pilot}	
17	30	15	256	20	18	0	2	0	0	15
17A	30	15	256	20	18	0	2	0	0	8-14
17B	60	30	128	40	36	0	4	0	0	8-14
18	60	30	128	40	38	0	2	0	0	15
18A	60	30	128	40	38	0	2	0	0	8-14
18B	120	60	64	80	76	0	4	0	0	8-14



Agreements on uplink compressed mode for enhanced DCH

- UL DPCCH is not transmitted during TG gap
- UL TFCI shall be transmitted in the first 10 slots that are transmitted (i.e. if TG starts at slot#8 or #9, the first slot(s) after the gap will transmit the remaining TFCI bits) within two consecutive radio frames in compressed mode
- The DL frame early termination is allowed during CM frames, and the FET-ACK is transmitted normally (excluding TG gap)
- ~~UL dynamic 10ms transmission selection shall be disallowed during compressed frame transmissions, and 20 ms mode is always used.~~
- UL DPCCH slot format does not change in compressed mode frames.
- No change is made to the currently allowed choices of compressed-mode parameters such as transmission gap length etc.

Friday 4th : Qualcomm suggested agreeing the yellow part. Final decision is to delete it and agreements are confirmed as shown above.

Not treated.

R1-141706	25.211 DRAFT CR (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	
R1-141707	25.212 DRAFT CR (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	
R1-141708	25.213 DRAFT CR (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	
R1-141709	25.214 DRAFT CR (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	
R1-141710	25.300 DRAFT CR (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	

Prepare LS to inform other working groups on the decisions for enhanced DCH – draft in R1-141757 is for email discussion/approval until 14th April - Qualcomm

6.3 UMTS Heterogeneous Networks Enhancements

WID in RP-140463.

6.3.1 Reliability of HS-DPCCH and other uplink channels

R1-141658	Analysis on the Solutions for HS-DPCCH Reception Reliability Issue in HetNet	NSN	

Proposal 1: Consider ILPC restriction method for legacy scenario
Proposal 2: Discuss if there is sufficient benefit from the secondary pilot for Rel-12 UEs to justify the added complexity for the UE and the network

Decision: The document is noted.

R1-141669	Evaluation of HS-DPCCH solutions	Huawei, HiSilicon	

Proposal 1: Adopt dynamic rate and power adjustment solution for Rel-12 UEs.
Proposal 2: UE generates TPC commands to ensure the reliability of F-DPCH transmitted by the LPN in SHO operation.

Decision: The document is noted.

R1-141687	On Reliability of Uplink Control Channels in Heterogeneous Network Deployments	Ericsson	

Proposal 1: Introduce a secondary physical uplink pilot channel solely power controlled by the serving cell, and let this serve as the basis for ensuring reliable reception of uplink control channels in the serving cell.
Proposal 2: The HS-DPCCH uses the secondary pilot as its reference channel (when enabled), i.e. the power of HS-DPCCH is set relative DPCCH2.

Decision: The document is noted.

R1-141688	HS-DPCCH Performance with Secondary Pilot – System Level Results	Ericsson	

Decision: The document is noted.

R1-141689	E-DPCCH Performance with Secondary Pilot – Link Level Results	Ericsson	

Decision: The document is noted.

R1-141239	Specification impact of schemes to improve reliability of HS-DPCCH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted.

R1-141670	Impact on specifications of HS-DPCCH solutions	Huawei, HiSilicon	

Proposal: To adopt dynamic rate and power adjustment solution to ensure the reliability of HS-DPCCH.

Decision: The document is noted.

Conclusion on HS-DPCCH
Secondary pilot as working assumption. The network is allowed not to configure the secondary pilot (it is optional for the network to use the secondary pilot). Evaluation of secondary pilot solution respect to the baseline (ILPC restriction and RRC signalling to updated the bed_ref) to be discussed at next meeting.

Decision will be made at RAN1 #77.

6.3.2 Mitigating interference from not SHO UEs

R1-141671	Discussion on solutions to mitigate interference from non-SHO users	Huawei, HiSilicon	

Proposal 1: Standardize the uplink ICIC solution to solve the uplink interference caused by the non-SHO UE.
Proposal 2: Send an LS to RAN3 to indicate the necessary information to perform ICIC.
Proposal 3: Enable the UE to receive extended E-HICH from the non-serving LPN when UE is identified in the non-SHO imbalance region by the network.

Decision: The document is noted.

Conclusion:
Configuration of E-HICH for the UE in the strong imbalance zone:
Evaluate the difference in performance between SHO and F-DPCH less radio link in strong imbalance zone where only E-HICH is configured.
These following options are identified by RAN1 as possible ways for the introduction of this feature in the specifications:
- Radio link in the UE Active Set with only E-HICH configured.
- E-HICH configured in cells that are not in the Active Set.

6.3.3 E-DCH decoupling

Not treated.

R1-141711	Lab Results on E-DCH Decoupling	Qualcomm Incorporated	

6.3.4 Signaling for CIO adaptation

R1-141672	Consideration on CIO adaptation	Huawei, HiSilicon	

Proposal: Higher layer measurements on channel quality (long term CQI measurement) are introduced to measure the UE realistic link level performance for serving cell and candidate neighbour cells.

Decision: The document is noted.

R1-141712	Configuration of CIO based on UE receiver capability	Qualcomm Incorporated	

Proposal 1: Maximum Supported CIO is signalled by the UE to aid the network in configuring appropriate UE specific CIO values

Proposal 2: Send an LS to RAN4 asking them to define minimum requirements in a Hetnet scenario for the maximum supported CIO.

Decision: The document is noted.

6.3.5 Other

Friday 4th

R1-141758	[DRAFT] LS on Progress in RAN1 #76bis for the UMTS Heterogeneous Networks WI	Huawei	R1-141761

The document was presented by Carmela Cozzo from Huawei.

Decision: The document is noted and final LS is agreed in R1-141761.

6.4 Further EUL Enhancements

WID in RP-140127.

6.4.1 HS-DPCCH overhead reduction

R1-141677	Way Forward on HS-DPCCH Overhead reduction for multi-RAB scenario	Huawei, HiSilicon, China Unicom	

Decision: The document is noted.

Agreement on HS-DPCCH overhead reduction

- The UE will revert to a second, longer CQI feedback cycle after a configured number of HS-SCCH TTIs of no transmission to the UE, and resume the normal CQI feedback cycle operation after HS-SCCH with consistent control information is detected by the UE.
  - It shall be possible to configure the second feedback cycle to be equal to the normal CQI feedback cycle

Working assumption on HS-DPCCH overhead reduction

- When the UE hits the maximum power limit and no other channels but DPCCH, DPDCH and HS-DPCCH have available power left to transmit
  - Transmit CQI=0 instead of valid CQI in sub-frames where CQI is required to be transmitted
  - Scale the β_{hs} when the CQI is transmitted in a HS-DPCCH sub-frame, but HARQ-ACK is not.
  - Scale DPCCH, DPDCH and HS-DPCCH equally for HS-DPCCH sub-frames where HARQ-ACK is transmitted.
- The new scaling behaviour and criteria for deriving CQI=0 is configurable by higher layer signalling

The capabilities related to HS-DPCCH overhead reduction should be defined as part of the further uplink enhancement work item by RAN2.

R1-141662	On HS-DPCCH overhead reduction	NSN	

Proposal 1: When the UE hits the maximum power limit, scale the β_{hs} when CQI is transmitted and only start scaling down the UL DPCCH/DPDCH when β_{hs} has reached zero.
Proposal 2: When the UE hits the maximum power limit, do not scale the β_{hs} when HARQ-ACK is transmitted, but scale DPCCH, DPDCH and HS-DPCCH down equally.
Proposal 3: No additional mechanisms are introduced to HARQ-ACK or CQI overhead reduction to Rel-12 for capacity improvements.

Document not treated.

R1-141676	Solutions for HS-DPCCH overhead reduction to improve capacity and coverage	Huawei, HiSilicon	

Proposal: Agree on the proposed way forward on HS-DPCCH overhead reduction to include CQI cycle adaptive solution for general multi-RAB case and HS-DPCCH power scaling solution for multi-RAB power limited case.

Document not treated.

R1-141694	HS-DPCCH Overhead Reduction for Multi-RAB Coverage Improvement	Ericsson	

Proposal 1: Agree on the HS-DPCCH overhead reduction scheme for multi-RAB UE in the power limited scenario.
Proposal 2: The HS-DPCCH overhead reduction should be configurable by the network, and is up to RAN2 to determine the way of activating/deactivating this feature at the RNC.

Decision: The document is noted.

R1-141715	HS-DPCCH Overhead Reduction	Qualcomm Incorporated	

Proposal 1: A timer is configured that resets when data is received on the downlink.

Proposal 2: Upon expiry of the timer, the selective scaling procedure for HS-DCCH is followed.
Proposal 3: When data transmissions are ongoing on the downlink, the UE's power limitation is signalled to the network through the TFCI field.
Proposal 4: The MSB of the TFCI field is used for this indication.
Proposal 5: Consider the CQI cycle adaptive solution to improve capacity when the UE is not power limited and there is no DL activity.
Proposal 6: If the cycle adaptive solution is adopted, then the DL inactivity timer configured for use in power limited situations is also used when the UE is not power limited as the triggering mechanism.

Decision: The document is noted.

Not treated.

R1-141678	RAN1 Specification Impact for the introduction of HS-DPCCH overhead reduction	Huawei, HiSilicon	

6.4.2 Other

R1-141695	CR on the HS-SCCH Order to Inform the UE to Perform the TTI Switch	Ericsson	

- The table numbering needs to be provided
- Table and section headings should attempt to be forward compatible and not preclude using the reserved orders for some other purposes than TTI switching.

Decision: The document is noted.

With the comments above the draft CR is considered as the baseline for introducing the TTI switching order to TS25.212, and incorporated in the CR introducing all the sub-features under the FEUL WI to the specification.

Send an LS to RAN2, RAN3 and RAN4 including all the agreements of the WI: R1-141756 (Ericsson)
Friday 4th : R1-141756 is for email discussion/approval until 10th April.

6.5 Enhanced Broadcast of System Information

WID in RP-140131.

6.5.1 Channel design

R1-141664	Achieving coverage with soft combining for BCH2	NSN	

Proposal 1: transmit the BCH2 in a fashion allowing soft combining at the UE
Proposal 2: The soft combining is done across exactly two consecutive BCH cycles.
Proposal 3: One of two following proposals 3a or 3b shall be taken into use, the TB size in both options would be the same:
Proposal 3a: The TTI length of the BCH2 is 10 ms, the SF is 128
Proposal 3b: The TTI length of the BCH2 is 20 ms, the SF is 256
Proposal 4: The BCH2 cycle length is made available to the UE over BCH1.
Proposal 5: Limit the SIB_REP on BCH2 to a value of 128
Proposal 6: Discuss whether a Change Indication of BCH2 on BCH1 is seen as beneficial.

Decision: The document is noted.

R1-141663	Link level simulation results for different transport block options for the secondary BCH channel	NSN	

Decision: The document is noted.

R1-141724	BCH Enhancements – Turbo Coding vs Convolutional Coding	Ericsson	

Proposal: BCH2 shall be convolutionally coded before being mapped to S-CCPCH

Decision: The document is noted.

R1-141679	Considerations on S-CCPCH design carrying BCH2	Huawei, HiSilicon	

Proposal 1: Reuse the same parameters of P-CCPCH in Table 1 for S-CCPCH carrying BCH2.
Proposal 2: Slot format 0 is used for S-CCPCH carrying BCH2.
Proposal 3: BCH2 is activated by means of indication on BCH1.
Proposal 4: The channelization code used for S-CCPCH carrying BCH is configurable.

Decision: The document is noted.

R1-141716	Design Aspects of BCH2 Channel	Qualcomm Incorporated	

Proposal 1: The TTI length for BCH2 is set to be 20ms.

Proposal 2: The TBS size used for BCH2 is set to be 246. The two 256 chips at the beginngin of each slot are DTX'ed.
Proposal 3: A new slot format (0A or 2A) is defined to support 18 data bits.
Proposal 4: The CRC to be used is 16 bits and the code to be used is rate ½ convolutional encoding.
Proposal 5: The UE shall not be required to receive more than two S-CCPCHs simultaneously.
Proposal 6: The OVSF code used for S-CCPCH is explicity specified.

Decision: The document is noted.

R1-141696	BCH Enhancements - Detailed Design of BCH2 Mapping to S-CCPCH	Ericsson	

The BCH2 transport channel shall be mapped to a separate S-CCPCH that is used exclusively for BCH2 data, i.e. no multiplexing with other transport channels shall be made.
The BCH2 transport channel shall use a 20 ms TTI.
There is only one non-zero transport format for the BCH2. When there is no data provided from higher layers, full DTX is applied for the TTI.
The transport format set for BCH2 contains two transport formats, TF0 = 0x276, TF1 = 1x276. When no data is provided from higher layers TF0 is used and full DTX is applied, i.e. no bits at all are transmitted on S-CCPCH (zero power cost).
A 16-bit CRC is used for the BCH2 transport channel
Rate ½ convolutional coding is used as channel coding scheme for the BCH2 transport channel.
The S-CCPCH carrying BCH2 shall use slot format 0, i.e. spreading factor 256 with no pilot or TFCI bits.
The S-CCPCH carrying BCH2 shall use the same TX diversity mode as the P-CCPCH.
The S-CCPCH carrying BCH2 shall use the same radio frame timing as the P-CCPCH.
The S-CCPCH carrying BCH2 shall use the primary scrambling code.
There is no need to signal any of the above mentioned parameters, they should be hard-coded in the specifications.
RAN1 would prefer to have the exact channelization code used for the S-CCPCH carrying BCH2 configurable, at least in the range of channelization code numbers 2-31. If this is not acceptable from an overhead point of view, further discussions are needed to determine which channelization code to hardcode for this purpose.
RAN2 should decide if the BCH2 transport channel should be a new transport channel type, or if existing BCH/FACH/PCH transport channels can be reused. From RAN1 perspective the name of the transport channel does not matter much.
RAN2 should be made aware that great flexibility exists in RAN1 for the detailed mapping of BCH2 to S-CCPCH, and if RAN2 has strong opinions on details in the proposed mapping (e.g. exact transport block size) those could most likely be accommodated by RAN1.

Decision: The document is noted.

Agreements:

- The BCH2 transport channel shall be mapped to a separate S-CCPCH that is used exclusively for BCH2 data, i.e. no multiplexing with other transport channels shall be made. The UE shall not be required to receive more than two S-CCPCHs simultaneously.
- The BCH2 transport channel shall use a 20 ms TTI.
- There is only one non-zero transport format for the BCH2. When there is no data provided from higher layers, full DTX is applied for the TTI.
- The transport format set for BCH2 contains two transport formats, TF0 = 0x246, TF1 = 1x246. When no data is provided from higher layers TF0 is used and full DTX is applied, i.e. no bits at all are transmitted on S-CCPCH (zero power cost).
- A 16-bit CRC is used for the BCH2 transport channel
- Rate ½ convolutional coding is used as channel coding scheme for the BCH2 transport channel.
- A new S-CCPCH slot format is defined to be equal to the existing P-CCPCH, i.e. support 18 data bits. The first 256 chips at the beginning of each slot are DTX'ed.
- The S-CCPCH carrying BCH2 shall use the same TX diversity mode as the P-CCPCH.
- The S-CCPCH carrying BCH2 shall use the same radio frame timing as the P-CCPCH.
- The S-CCPCH carrying BCH2 shall use the primary scrambling code.
- It is RAN1's opinion to have the channelization code configurable, and further discussion to happen in RAN2.

Send an LS to RAN2 including the agreements above.

R1-141755	LS on Enhanced BCH parameters	RAN1, Ericsson	

Decision: The document is noted and is agreed.

6.6 Study on Scalable Bandwidth UMTS by Filtering

SID in RP-132122.

6.6.1 Evaluation for standalone scenario

R1-141680	Uplink performance for F-UMTS	Huawei,HiSilicon	

Decision: The document is noted.

R1-141697	Scalable UMTS – Uplink Aspects	Ericsson	

Decision: The document is noted.

R1-141665	PRACH preamble analysis for S-UMTS	NSN	

Decision: The document is noted.

R1-141681	PRACH design for F-UMTS	Huawei,HiSilicon	

Decision: The document is noted.

Not treated.

R1-141698	Scalable UMTS – Text Proposal on Uplink Signal Characteristics	Ericsson	

6.6.2 Evaluation for multi-carrier scenario

R1-141682	Design for cross carrier scheduling for F-UMTS carrier aggregation	Huawei,HiSilicon	

Decision: The document is noted.
Question whether case of the scalable carrier being used as standalone for some (voice) users and in multicarrier mode for other users is of interest?
China Unicom, Huawei not interested.

R1-141683	On the need of introducing cross carrier scheduling for F-UMTS carrier aggregation	Huawei,HiSilicon	

Decision: The document is noted.

R1-141717	On cross carrier scheduling for S-UMTS carrier aggregation	NSN	

Decision: The document is noted.

6.6.3 Other

R1-141666	On DL processing of AICH, PICH and multiantenna techniques for S-UMTS	NSN	

Decision: The document is noted.

R1-141240	S-UMTS bandwidth detection	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted.

R1-141667	SCH for S-UMTS	NSN	

Decision: The document is noted.

Consider at RAN1#77 what further TPs (if any) should be included into the TR.

6.7 Other

R1-141684	Further considerations on enhancement to uplink power control algorithm 2 to reduce power consumption of DL TPC commands	Huawei, HiSilicon	

Decision: The document is noted.

7 E-UTRA

7.1 Maintenance of E-UTRA Releases 8 – 11

R1-141144	Discussion on UCI multiplexing on PUSCH in measurement gap	Intel Corporation	

The document was presented by Seunghee Han from Intel and discusses an issue of backward compatibility due to the changed wording by a CR **Error! Reference source not found.**R1-112777]. Both wording in terms of (1) backward compatibility for non-CA and (2) no behaviour change of the current spec for CA are needed; that is, (1) "*if UE not configured with carrier aggregation is configured to send PUSCH and SRS in the same subframe for initial transmission*" for backward compatibility and (2) "*if UE transmits PUSCH and SRS in the same subframe for initial transmission*" for carrier aggregation in TS36.212.

Discussion: Companion CR is R1-141145.
Decision: The document is noted.

R1-141145	(36.212,F,Rel-10) Correction on UCI multiplexing on PUSCH	Intel Corporation	

The document was presented by Seunghee Han from Intel and clarifies that "if UE not configured with carrier aggregation is configured to send PUSCH and SRS in the same subframe for initial transmission".
Discussion: Panasonic/TI would like to review it for better wording improvement.
Qualcomm requested off line discussion to better understand the issue.
Decision: The document is noted. Offline discussion and revisit on Friday.
Friday 4th

R1-141891	36.212 CR0157 (Rel-12, F) Correction on UCI multiplexing on PUSCH	Intel Corporation	(R1-141145)

Decision: The document is for email approval until 10th April.

R1-141581	Discussion on PUCCH reporting payload size	Huawei, HiSilicon	

The document was presented by Yuanjie Li from Huawei and states that "bits/BP" in table 7.2.2-3 of 36.213 needs to be corrected. Two alternative corrections can be considered:

- Alt1: Delete "bits/BP" in table 7.2.2-3
- Alt2: Replace "bits/BP" with "bits/BP or bits" in table 7.2.2-3

Discussion: Alt2 is preferred by Huawei.
Decision: The document is noted.

R1-141582	Correction on PUCCH reporting payload size	Huawei, HiSilicon	

The document was presented by Yuanjie Li from Huawei and is a CR for above alternative 2.
Decision: The document is noted. Offline discussion and revisit on Friday.
Friday 4th :

R1-141886	36.213 CR0459 (Rel-12, F) Clarification on PUCCH reporting type payload size	Huawei, HiSilicon, Ericsson	(R1-141582) R1-141894

Wrong spec version: should be 12.1.0.
Decision: The document is noted and agreed as revision 1 in R1-141894.

R1-141433	Draft Rel-12 CR on Clarification on UE port based CRC masking	Qualcomm Inc.	R1-141740

The document was presented by Wanshi Chen from Qualcomm and clarifies that when UE port based antenna selection mask for DCI format 0 is only applicable to UEs configured with closed-loop UE transmit antenna selection.
Discussion: Shall CR be considered by 36.212 editor for inclusion?
Broadcom preferred to keep R1-141433 as a separate CR. Supported by other companies to ease better tracking.
Decision: The document is noted. Revision should be prepared in R1-141740 (MCC to provide CR number).
Friday 4th

R1-141740	36.212 CR0156 (Rel-12, F) Clarification on UE port based CRC masking	Qualcomm	(R1-141433)

Decision: The document is noted and agreed.

R1-141699	Draft Rel-12 CR on antenna port definitions	Qualcomm Inc., Panasonic	

The document was presented by Peter Gaal from Qualcomm and suggests adding a description of the boundaries in frequency and time within which the inference of channels from one RE to another RE on the same antenna port may be applied.
Discussion: Concern about the need of such CR.
Decision: The document is noted. Offline discussion and revisit on Friday.
Friday 4th

R1-141875	Draft Rel-12 CR on antenna port definitions	Qualcomm Inc., Panasonic, Ericsson, Fujitsu	(R1-141699) R1-141895

Wrong spec version: should be 12.1.0.
Decision: The document is noted and agreed as CR0189 in R1-141895.

7.2 LTE Release 12

7.2.1 Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation

WID in RP-121772. Open issues are listed in SR RP-140192

R1-141871	Summary of Ad-hoc session on Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation	Ad-Hoc Chairman (Qualcomm)	

The document was presented by Wanshi Chen from Qualcomm and provides the outcomes of eIMTA sessions.
Decision: The document is endorsed and incorporated below.

R1-141563	Draft TP on eIMTA for TS 36.300	NSN, Nokia, CATT	

Decision: The document is noted.

Email discussion on the detailed text until April 11 (Timo, NSN), including an LS to RAN2 when the final text is agreed.

R1-141842	Outcome of the offline discussion on eIMTA	CATT	

Decision: The document is noted.

Agreement:

- Confirm the working assumption of "For aperiodic CSI reporting in transmission mode 10 for a single serving cell when the UE is configured with 1 CSI process, only CSI for one subframe set is reported in any subframe."
- If CSI-IM is defined in a subframe and the subframe is indicated as uplink subframe according to the L1 reconfiguration DCI, UE shall not assume the CSI-IM is present in this subframe.
- If a UE is enabled with eIMTA on the PCell and is configured with PUCCH format 3 for HARQ-ACK transmission, the Rel-10/11 PUCCH format 3 UE behaviors apply, except that the UE shall use the DL HARQ reference configuration and under fallback, resource allocation scheme for PUCCH format 1a/1b
- For a UE configured with CA and eIMTA on at least one serving cell, the Rel-10/11 TDD-TDD CA UE behaviors on HARQ-ACK transmission and soft buffer handling and the Rel-12 FDD-TDD CA UE behaviors on HARQ-ACK transmission and soft buffer handling apply, except that the DL HARQ reference configuration replaces the UL-DL configuration indicated by SIB1 (in case of PCell) and the UL-DL configuration indicated by *tdd-Config-r10* (in case of SCell) .
- If a subframe to be used for PUSCH transmission is changed to a DL subframe according to the L1 reconfiguration DCI, the UE shall not transmit the PUSCH.
- For a UE configured with FDD as PCell and eIMTA on a Scell, a 10-bit bitmap is used to configure the set of subframes in the *n*th radio frame to monitor the L1 reconfiguration DCI, where *n* the periodicity (in unit of radio frames) of monitoring the L1 reconfiguration DCI.
- For a UE configured with eIMTA on a scheduling SCell, if the UE does not detect a valid UL-DL configuration for a radio frame via the reconfiguration DCI for the scheduling SCell, the UE shall monitor (E)PDCCH in non-DRX DL and special subframes of the radio frame according to the UL-DL configuration indicated by *tdd-Config-r10*.
- Uplink open-loop power control RRC parameters related to UL SPS for a second UL subframe set are supported
- If a UE is configured with UL power control subframe sets and accumulation is not configured for a serving cell, *fc(i)* is maintained per subframe set.
- The last $\left(L_{\text{format 1C}} - \left\lfloor \frac{L_{\text{format 1C}}}{3} \right\rfloor \cdot 3\right)$ bits are set to zero in the reconfiguration DCI, where $L_{\text{format 1C}}$ is the DCI format 1C size on the PCell of the UE
- If a UE is configured with eIMTA and two subframe sets for uplink power control of a serving cell, the UE can be configured by RRC signalling with two sets of β_{offset}^{RI} and β_{offset}^{CQI} values, one for each UL subframe set for the serving cell.

R1-141850	Summary of eIMTA open issues	CATT	

Decision: The document is noted.

Agreement:

- For CSI reporting for TM 10, confirm the working assumption "Minimum UE capability on the number of CSI processes for TDD eIMTA is one"
- When 2 CSI subframe sets are configured for an eIMTA UE, the triggering mechanism for A-CSI for TM 1-10, for both non-CA and CA cases, a 2-bit indicator is utilized for control channels in UE-specific search space
  - For the non-CA case when there is a single CSI process, the current 1-bit CSI information field is updated to 2-bit information field; for other cases, the current 2-bit information filed is re-used
  - How to map the 3 triggering states are FFS
  - FFS how to map the 1-bit CSI information field for control channels in common search space, targeting minimal spec impact
  - Note: for each CSI process, only up to one subframe set is reported in any given subframe

A list of topics for email discussion will be prepared and shared.

R1-141887	Summary of Thursday offline wIMTA discussion	CATT	

The document was presented by Zukang Shen from CATT and deals with the following issues:

- Issue #1: CSI-IM related for TM10
- Issue #2: Any details on A-CSI triggering, based on the agreement based on Wed.
- Issue #3: eIMTA UE capability related:

Decision: The document is noted.

Working assumption:

- In Rel-12, no change to the definition of a CSI-IM resource compared to Rel-11
- One CSI process can be configured with 2 CSI-IM resources only if the CSI process is also configured with 2 Rel-12 CSI subframe sets
- If one CSI process is configured with 2 CSI-IM resources and with 2 Rel-12 CSI subframe sets, no RAN1 specification change in terms of the association between subframe sets and CSI-IM resources
  - Can revisit if significant issue(s) is identified
- A UE can be configured with up to 4 Rel-11 CSI-IMs for a serving cell.
- If a UE is configured with 4 Rel-11 CSI-IM resources, the UE can be configured with multiple CSI processes using all 4 Rel-11 CSI-IMs only if the UE is configured with eIMTA and at least one of the CSI processes is configured with two CSI-IM resources.
- If a UE is configured with more than one CSI process, at most 2 CSI processes can be configured with 2 CSI-IM resources each, only if each of the two CSI processes is also configured with 2 Rel-12 CSI subframe sets
  - Rel-12 CSI subframe sets are common to all CSI processes for a serving cell

Agreements:

- If a UE is configured with eIMTA on any serving cell and if the newly introduced Rel-12 two subframe sets are not configured for any of the serving cells, the existing triggering mechanisms/tables are reused
- Email discussion on how to map the 2-bit A-CSI triggering field until April 11 (Zukang, CATT) using R1-141887 as a starting point

Proposals:

- Reference resource definition for aperiodic CSI for TM 1 – 9:
  i. Option 1: valid DL subframe in the latest subframe no later than subframe n – 4 and corresponding to the triggered CSI subframe set
     - CATT, ALU/ASB, LGE, ZTE, Ericsson, Potevio, Samsung
     - Objected by: Qualcomm, Sharp
  ii. Option 2: valid DL subframe in the latest subframe no later than subframe n-4 and no earlier than the subframe containing the aperiodic CSI trigger
     - Qualcomm, Sharp, Broadcom, Huawei, HiSilicon
     - Objected by: CATT, LGE, Ericsson, ALU, ASB, Samsung, ZTE

Proposed working assumption:

- Regarding reference resource definition for aperiodic CSI for TM 1 – 9, valid DL subframe is defined as the latest subframe no later than subframe n – 4 and corresponds to the triggered CSI subframe set
- Objected by: Qualcomm, Sharp

7.2.1.1 Remaining details on CSI feedback

R1-141174	Remaining details on aperiodic CSI feedback for transmission mode 1~9	CATT	

Decision: The document is noted.

Not treated.

R1-141175	Remaining details on aperiodic CSI feedback for transmission mode 10	CATT	
R1-141176	Remaining details on periodic CSI feedback	CATT	
R1-141241	Remaining details on CSI feedback for eIMTA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-141271	Remaining Issues for P-CSI Reporting	Samsung	
R1-141272	Discussion on CSI feedback for eIMTA	Samsung	
R1-141317	Aperiodic CSI reporting in TM1-9 for eIMTA	Sharp	

R1-141318	Remaining issues on periodic CSI reporting during fallback for eIMTA	Sharp	
R1-141329	Remaining Details on CSI Measurement and Report for TDD eIMTA	LG Electronics	
R1-141420	Remaining details of CSI feedback for TDD eIMTA	ZTE	
R1-141434	CSI measurement and reporting in eIMTA	Qualcomm Inc.	
R1-141551	Discussion on the remaining details of CSI Feedback for eIMTA	Intel Corporation	
R1-141583	Discussion on remaining details for CSI feedback for eIMTA	Huawei, HiSilicon	
R1-141620	Discussion on Aperiodic CSI in TM1-9 for eIMTA	Potevio	
R1-141628	Aperiodic CSI reporting for eIMTA	Ericsson	
R1-141629	Remaining issues on CSI feedback for eIMTA	Ericsson	
R1-141839	Way Forward on CSI process and CSI-IMR for TDD eIMTA	ZTE, Ericsson, Intel	
R1-141845	WF on CSI reference definition for eIMTA	LG Electronics, Ericsson, Samsung, CATT, Potevio	
R1-141846	Way Forward on aperiodic CSI feedback for TM10 with eIMTA	Huawei, HiSilicon, Qualcomm, Samsung	

7.2.1.2 Remaining HARQ details

Not treated.

R1-141146	Remaining issues of HARQ feedback for eIMTA	Intel Corporation	
R1-141177	Remaining details on HARQ-ACK on PUSCH	CATT	
R1-141178	PUCCH Format 3 for eIMTA	CATT	
R1-141179	PUCCH Format 1 with channel selection for eIMTA	CATT	
R1-141210	UL Index and DAI bits in DCI format 0/4	Panasonic	(R1-140496)
R1-141242	Remaining HARQ details for eIMTA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-141273	UCI Transmission in PUSCH	Samsung	
R1-141274	Remaining issues on HARQ timings	Samsung	
R1-141275	HARQ-ACK feedback procedures for eIMTA	Samsung	
R1-141319	PUCCH resource allocation for dynamic HARQ-ACK in eIMTA	Sharp	
R1-141320	HARQ-ACK reporting on PUCCH for eIMTA	Sharp	
R1-141321	UL and DL reference UL-DL configurations in TDD CA with eIMTA	Sharp	
R1-141330	Remaining Details on HARQ Feedback for TDD eIMTA	LG Electronics	
R1-141418	Inconsistency between reconfiguration signaling and UL grant/PHICH	ZTE	
R1-141435	HARQ-ACK feedback for eIMTA	Qualcomm Inc.	
R1-141521	HARQ timing determination in the case of CA	NSN, Nokia	
R1-141522	Usage of UL DAI and UL Index with UL reference configuration #0	NSN, Nokia	
R1-141523	Summary of email discussion [76-06]	NSN	
R1-141584	Remaining issues for HARQ-ACK feedback on PUCCH	Huawei, HiSilicon	
R1-141585	HARQ-ACK feedback bits on PUSCH for eIMTA	Huawei, HiSilicon	

7.2.1.3 Other

Not treated.

R1-141116	Remaining open issues for eIMTA	Huawei, HiSilicon	
R1-141180	Other remaining issues for TDD eIMTA	CATT	
R1-141200	Remaining details on reconfiguration signalling	NEC	
R1-141276	Signaling for Adaptation of TDD UL-DL Configurations in CA	Samsung	
R1-141277	Remaining Issues with RRC Impact for eIMTA	Samsung	
R1-141322	Details on monitoring subframes for recnfiguration DCI in TDD CA and eIMTA	Sharp	
R1-141331	Other Remaining Issues for TDD eIMTA	LG Electronics	
R1-141369	Discussion on RRC impact of TDD eIMTA	New Postcom	

R1-141375	Remaining Details of UL/DL Reconfiguration for eIMTA	HTC	
R1-141419	Remaining issues in UL power control	ZTE	
R1-141436	Remaining issues for eIMTA	Qualcomm Inc.	
R1-141437	SPS operation in TDD eIMTA	Qualcomm Inc.	
R1-141630	On the need of new RRC parameters for eIMTA	Ericsson	

Email approval until 17th April about updated RRC parameters list to RAN2 – (CATT)

7.2.2 Low Cost & Enhanced Coverage MTC UE for LTE

WID in RP-140522

R1-141872	Summary of Ad-hoc session on Low Cost & Enhanced Coverage MTC UE for LTE	Ad-Hoc Chairman (Qualcomm)	

The document was presented by Wanshi Chen from Qualcomm and provides the outcomes of Low cost MTC sessions.
Decision: The document is endorsed and incorporated below.

7.2.2.1 Remaining details of new UE category/type

of PRBs

R1-141748	Summary of offline discussion on low complexity MTC UE	Vodafone	

Decision: The document is noted.

R1-141632	Impacts of PRB restriction for low cost MTC UE	Ericsson	

Decision: The document is noted.

R1-141633	Resource allocation for low cost MTC UE	Ericsson	

Decision: The document is noted.

Agreement:

- For broadcast traffic, there is no explicit restriction on the resource allocation size for MTC UEs
- There is no change of the current mapping defined for existing UE categories between MCS indices and TBS lookup indices (I_MCS) for MTC UEs
- For unicast traffic, there is implicit restriction on the resource allocation size due to the max TBS limitation (1000 bits) under explicit MCS indices (e.g., the MCS indices mapped to explicit TBS lookup indices) for Cat 0 UEs
  - For implicit MCS indices (e.g., 29/30/31 in the current MCS table), there is no restriction on the resource allocation size
  - Note:
    - There is no cost saving gains of imposing an explicit restriction for unicast since there is no explicit restriction for broadcast traffic
    - As brought up by some companies, an explicit restriction for unicast may be forward compatible considering possible narrow band related design for low cost UEs

Reply to incoming LS (R1-141862) received during the week:

R1-141866	Reply LS on Resource allocation restriction and identification of low complexity MTC UEs	Vodafone	

Decision: The document is noted.

Conclusion:

- It was shown by one company that if eNB knows a Category 0 UE with 1 RX antenna, e.g. during Paging and/or RAR, it helps increase random access response capacity. However, RAN1 has not concluded the study on whether or not it is beneficial for the eNB to know a Category 0 UE with 1 RX antenna, e.g. during Paging and/or RAR. RAN1 will further discuss it in RAN1#77 and will inform RAN1's updates on this issue, if any, to RAN2 accordingly.
- Note: the 1000-bit limitation also applies to PUSCH

Update the LS by incorporating the above conclusions (and remove the action to RAN4, but adding RAN4 to receive and CC RAN3) in R1-141890. The LS is for email approval until April 10th (Vodafone)

Scheduling Options

Agreements:

- For category 0 UEs, the scheduling and HARQ timing for PDSCH and PUSCH are the same as category 1 UEs

- The case of HD-FDD is FFS

HD-FDD

R1-141118	HD-FDD operation of low cost UEs based on the LS reply from RAN4	Huawei, HiSilicon	

Decision: The document is noted.

R1-141149	Remaining aspects for low cost MTC UE	Intel Corporation	

Decision: The document (Section 4 only) is noted.

R1-141181	Number of HARQ processes for low complexity HD-FDD UEs	CATT	

Decision: The document is noted.

R1-141334	HD-FDD support for low-cost MTC	LG Electronics	

Decision: The document is noted.

R1-141526	HD-FDD Low Cost MTC UE	NSN, Nokia	

Decision: The document is noted.

R1-141631	Half duplex FDD for low cost MTC UE	Ericsson	

Decision: The document is noted.

Conclusion:

- FFS till RAN1#77 focusing on at least the following areas:
  - Whether or not current specification is sufficient to handle Tx/Rx and Rx/Tx switching
  - Assumption of the number of local oscillators
  - # of HARQ processes
  - Soft buffer management
  - Impact, if any, on PDCCH monitoring and CSI reporting
  - Impact, if any, on PHICH handling

Others

R1-141461	Update Views on FFS on new UE category/type	Panasonic	

Decision: The document is noted.

Conclusion:

- FFS until RAN1 #77 focusing on at least the following issues:
  - Whether or not there is any need/benefits to change PDCCH search space and DCI sizes
  - Impact, if any, on ACK/NAK resource allocation
  - Whether or not Cat. 0 UEs can be served by eNBs without knowledge of Cat. 0 UEs, and if so, any issues
  - Whether or not simultaneous unicast and broadcast is allowed (depending on whether or not there is a decision in RAN2 or not)
  - Transmission mode(s) supported by Cat. 0 UEs
  - Whether or not EPDCCH is supported
  - Whether or not SPS is supported
  - Issues, if any, on coverage for TDD with Cat. 0 UEs
  - Details of Category 0 to be incorporated into 36.306

Not treated.

R1-141119	Discussion on the resource allocation for low cost MTC UEs	Huawei, HiSilicon	
R1-141147	Details on PDSCH scheduling for low cost MTC UE	Intel Corporation	
R1-141148	On reduced downlink bandwidth of 1.4MHz for low cost MTC UE	Intel Corporation	
R1-141171	Summary of email discussion on Low Cost UE scheduling Options	Sierra Wireless	
R1-141172	Low Complexity UEs PRB Limit Evaluation	Sierra Wireless	
R1-141173	Reduce PDCCH Blind Decoding Options	Sierra Wireless	
R1-141182	DL bandwidth reduction of low complexity UEs	CATT	
R1-141201	PDSCH scheduling options for low cost MTC UEs not in enhanced coverage mode	NEC	
R1-141211	Discussion on MTC scheduling options	Panasonic	

R1-141243	Considerations for low cost MTC UE	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-141278	Remaining issues of low cost MTC	Samsung	
R1-141323	PDSCH scheduling for low-cost MTC UEs	Sharp	
R1-141332	Scheduling method for supporting low-cost MTC	LG Electronics	
R1-141333	(E)PDCCH related issues for low-cost MTC	LG Electronics	
R1-141371	PDSCH scheduling for low cost MTC UE	New Postcom	
R1-141411	Analysis on low cost MTC UEs	ZTE	
R1-141412	PDSCH PRB locations for common and unicast channels for low cost MTC UEs	ZTE	
R1-141438	Remaining details of UE category type	Qualcomm Inc.	
R1-141462	Remaining details of bandwidth reduction for low cost MTC	NTT DOCOMO	
R1-141482	Analysis on PDSCH resource allocation for low cost MTC	MediaTek Inc.	
R1-141524	PDSCH PRB Limitation for Low Cost MTC UE	NSN, Nokia	
R1-141525	PDSCH Scheduling for Low Cost MTC UE	NSN, Nokia	
R1-141552	On PDSCH scheduling for LC MTC UE	InterDigital	
R1-141566	On forward compatibility of Rel-12 low complexity MTC specification	Sony	
R1-141567	Views on PDSCH buffering options for low-complexity MTC UEs	Sony	
R1-141568	Support for contiguous and non-contiguous resource allocation for low-complexity MTC UEs	Sony	
R1-141569	On reduced baseband bandwidth support of low-complexity MTC UEs	Sony	
R1-141606	Remaining details of low complexity MTC UE	Motorola Mobility	
R1-141624	Design impact of PDCCH and PDSCH scheduling of Rel-12 low complexity MTC UEs	Vodafone	

7.2.3 LTE TDD-FDD Joint Operation including Carrier Aggregation

WID in RP-140465.
Mr Chair's recommendation: Only open issue from SR (RP-140517), TDD Pcell DL HARQ timing for TDD-FDD carrier aggregation with self-carrier scheduling on FDD Scell, will be treated with minimal time unit allocation. If no consensus is made, TDD PCell for TDD-FDD carrier aggregation is not supported in Rel. 12.

Mr Chair summarized the status from RAN1 #76 contributions and discussions as follows:

R1-140957 Way Forward on HARQ timing for TDD-FDD CA LG Electronics, ETRI, NTT, NTT DOCOMO, Nokia, NSN, Samsung, ITL, Orange, NEC, I2R, KT Corp., Sharp, Telefonica, Kyocera, Hitachi (16)
R1-140958 Alternative Way Forward on HARQ timing for TDD-FDD CA LG Electronics, NTT, NTT DOCOMO, Ericsson, ETRI, Panasonic
Also supported by KT, KDDI, Samsung (with a following minor update about 1st sub-bullet), Sharp, NEC, Nokia, NSN, Hitachi, Sony (15)

- ACK/NACK channel selection can be configured only with the TDD PCell UL/DL configurations which don't require DL HARQ timing with M>4 on the FDD Scell
  - HARQ ACK feedback with PUCCH format 1B with channel selection is supported only for configurations #0, #1, and #6
- When configured with PF3, maximum number of aggregated cells is limited for the M>4 cases so that number of ACK/NACK bits on PF3 does not exceed 21

R1-140977 Way forward on FDD Scell PDSCH HARQ timing with TDD as Pcell CATT, ALU, ASB, CMCC, CATR, HTC, III, Potevio, Coolpad, Huawei, HiSilicon, Blackberry, ITRI (13)

Conclusion from RAN1 #76:

- No consensus for either R1-140958 and R1-140977 about TDD Pcell DL HARQ timing for TDD-FDD carrier aggregation with self-carrier scheduling

R1-141745	WF on HARQ timing for TDD-FDD CA	LG, NTT, NTT DOCOMO, Ericsson, ETRI, KDDI, Samsung, Sharp, NEC, Nokia, NSN, Hitachi, KT Corp., Orange, Telefonica, ZTE, Texas Instruments, Inter Digital, NVIDIA, Telecom Italia, LG Uplus, Vodafone	

The document was presented by Joon Kui Ahn from LGE.

- HARQ-ACK timing for DL self-scheduling of FDD SCell in case of TDD PCell is defined as in following table

TDD PCell UL-DL Conf.	HARQ timing	Subframe *n*									
		0	1	2	3	4	5	6	7	8	9
0	0A	-	-	6, [5]	[5], [4]	4	-	-	6, [5]	[5], [4]	4
1	1*			7, 6	[6], [5], 4				7, 6	[6], [5], 4	
2	2	-	-	8, 7, 6, [5], 4	-	-	-	-	8, 7, 6, [5], 4	-	-
3	3	-	-	11, [10], [9], [8], 7, 6	6, 5	5, 4	-	-	-	-	-
4	4	-	-	12, 11, [10], [9], 8, 7	7, 6, 5, 4						
5	5	-	-	13, 12, 11, [10], 9, 8, 7, 6, 5, 4	-	-	-	-	-	-	-
6	6	-	-	[8], 7	7, [6]	[6], 5	-	-	7	7, [6], [5]	-

- ACK/NACK channel selection can be configured only with the TDD PCell UL/DL configurations which don't require DL HARQ timing with M>4 on the FDD SCell.
- When configured with PF3, maximum number of aggregated cells is limited for the M>4 cases so that number of ACK/NACK bits on PF3 does not exceed 21.

Discussion: Also supported by ITL.
Decision: The document is noted.
Objecting companies: CATT, CMCC, Huawei, HiSilicon.
CATT asked checking the status against previous meeting WF in R1-140977.
Objecting companies**:** NTT DoCoMo, LGE, Samsung, NEC, Nokia, NSN, Sharp, Ericsson, ETRI
CATT suggested concluding "No consensus to support TDD PCell for TDD UL carrier aggregation capable UE"

R1-141785	Way Forward on TDD-FDD CA with TDD Pcell	Huawei, HiSilicon, CATT, CMCC	

The document was presented by David Mazzarese from Huawei.

- If the HARQ-ACK feedback mechanism of dual connectivity is supported for CA, then it will be supported for TDD/FDD CA with either TDD or FDD as PCell, as well as TDD CA and FDD CA.
  - This will be discussed in Rel-12 dual connectivity WI
- Send an LS to inform this decision to RAN (cc RAN2)

Decision: The document is noted.

Possible conclusion (1st attempt)

- There is no consensus of TDD PCell and FDD SCell in the Rel-12 TDD-FDD CA WI.

Possible conclusion (2nd attempt)

- Dual connectivity TDD Pcell and FDD Pcell can be further discussed according to dual connectivity WID.
- Extending the relevant dual connectivity design to support the CA with TDD PCell and FDD SCell can be discussed in the Rel-12 dual connectivity WI.
- Send LS to RAN and RAN2

Objected by: Nokia, Ericsson, ZTE
Supported by: Huawei, CATT, CMCC, CATR, New Postcom

Conclusion of Tuesday 1st session:

- There is no consensus of TDD PCell and FDD SCell in the Rel-12 TDD-FDD CA WI
- Send LS to RAN2 (CC: RAN) – Prepare draft LS in R1-141793 - (Nokia) and revisit on Thursday

Thursday 3rd

R1-141876	WF on TDD FDD CA	CATT	

The document was presented by Zukang Shen from CATT.

- For TDD-FDD CA with TDD as Pcell and self carrier scheduling, the following new HARQ timings are adopted as the PDSCH HARQ timing on a FDD Scell

TDD PCell UL-DL Conf.	Subframe *n*								
	0	1	2	3	4	5	6	7	8	9
0/1/6			7, 6	[6], [5], 4				7, 6	[6], [5], 4	
2	-	-	8, 7, 6, [5], 4	-	-	-	-	8, 7, 6, [5], 4	-	-
3/4	-	-	12, 11, [10], [9], 8, 7	7, 6, 5, 4						
5	-	-	13, 12, 11, [10], 9, 8, 7, 6, 5, 4	-	-	-	-	-	-	-

- No further optimization in RAN1 related to the above new HARQ timings

Discussion: Also supported by Nokia, NSN, Ericsson, NVIDIA.
Qualcomm: RAN1 looked at several proposals in past meetings and including RAN1#76b. Qualcomm is unhappy with over turning the conclusions reached early in the week. Nevertheless, checking further the proposal in R1-141876 is needed – selection between the two proposals could be done until Friday
NTT DoCoMo: why a new timings table now? Tables are technically quite similar, and original option in R1-141745 already got more supports. – but also agree with Qualcomm approach.
Mr Chair: no more time unit will be allocated to TDD FDD CA.
CATT: Comparing the proposals in R1-141745 and R1-141876, there are no technical drawback of the proposal in R1-141876.
CATT: Proposal in R1-141745 unnecessarily introduces more new HARQ timings, which increases the implementation and testing cost.
Decision: The document is noted.

Conclusion of the session:
CMCC, Huawei and HiSilicon withdrew their objection to R1-141745 in order for TDD Pcell to be supported in Rel-12.
CATT continued to object as they felt R1-141745 was unnecessarily complex.
Qualcomm still object to R1-141876 for the following reason(s): Qualcomm is unhappy with over turning the conclusions reached early in the week Checking further proposal in R1-141876 is needed.
CATT: if Qualcomm objects to R1-141876 they should also object to R1-141745 since agreeing on either one of them is over turning the conclusions.
DoCoMo's still object to R1-141876 for the following reason(s): Tables are technically quite similar, and original option in R1-141745 already got more supports.
CATT withdrew their objection to R1-141745.
The draft LS stating that RAN1 could not reach consensus is withdrawn.

R1-141793	[Draft] LS on remaining open RAN1 TDD-FDD CA issues	Nokia	

Conclusion: Way Forward on HARQ timing in R1-141745 is agreed.

Friday 4th

R1-141528	Remaining issues on TDD-FDD CA DCI format	Nokia, NSN	

The document was presented by Klaus Hugl from Nokia and proposes that RAN1 confirms the working assumptions as:

- Proposal 1: If PCell uses FDD and the scheduled SCell uses TDD:
  - DL DCI and UL DCI formats: no UL DAI, no DL DAI
  - UL DCI formats include 2-bit UL index field only if UL/DL configuration 0 is used
  - DL DCI formats include 3-bit HARQ process number field
- Proposal 2: If TDD PCell is supported, and both PCell and the scheduled SCell use TDD:
  - DL DCI formats include 2-bit DL DAI and 4-bit HARQ process number field
  - UL DCI formats include 2-bit UL index field only if UL/DL configuration 0 is used; otherwise UL DCI formats include 2-bit DAI field

Decision: The document is noted.

Agreements in RAN1 #76 and email agreement after RAN1 #76:

- DL/UL DCI format for PCell follows existing specification
- 1 bit SRS request field in DCI format 2B/2C/2D (if aperiodic SRS is configured) exists only when TDD SCell is a scheduled cell regardless whether the scheduling cell is TDD or FDD.
- If both PCell and the scheduled SCell use FDD:
  - DL DCI and UL DCI formats: no UL index, no UL DAI, no DL DAI
  - DL DCI formats include 3-bit HARQ process number field
- If TDD PCell is supported, when PCell uses TDD and the scheduled SCell uses FDD:
  - DL DCI formats include 2-bit DL DAI and 4-bit HARQ process number field
  - UL DCI formats include 2-bit UL DAI
  - No UL index field exists in UL DCI formats
- For other cases,
  - Option B as working assumption for FDD PCell case
  - Option B as working assumption for TDD PCell case, if TDD PCell self-scheduling is supported

Agreement:

- Set above "Option B" as agreement

Not treated.

R1-141150	Remaining aspects for TDD-FDD CA supporting	Intel Corporation	
R1-141183	PDSCH HARQ timing of FDD SCell with TDD as PCell	CATT	
R1-141265	Remaining issues for TDD-FDD CA	ETRI	
R1-141267	Discussion on TDD Pcell DL HARQ timing with self-carrier scheduling on FDD Scell	China Telecom	
R1-141279	CSI feedback for TDD-FDD CA	Samsung	
R1-141280	SRS transmission for TDD-FDD CA	Samsung	
R1-141281	DL HARQ timing for FDD Scell in TDD-FDD CA	Samsung	
R1-141282	DCI format designs for TDD-FDD CA	Samsung	
R1-141283	Half-duplex UE operation for TDD-FDD CA	Samsung	
R1-141324	DL HARQ-ACK for TDD-FDD CA with TDD Pcell	Sharp	
R1-141325	Remaining details of Periodic CSI reporting for Rel-12 TDD-FDD Carrier Aggregation	Sharp	
R1-141335	Options of DL HARQ timing for TDD PCell self scheduling case	LG Electronics	
R1-141336	Remaining RAN1 specification details for TDD-FDD CA	LG Electronics	
R1-141368	DL HARQ timing for TDD-FDD CA with self-carrier scheduling when TDD is PCell	FiberHome	
R1-141373	Consideration on TDD-FDD joint operation	New Postcom	
R1-141400	Remaining Issues for TDD-FDD CA	ZTE	
R1-141439	Solution for TDD-FDD CA	Qualcomm Inc.	
R1-141476	DL HARQ Timing for self-carrier scheduling when PCell is TDD and SCell is FDD	ITRI	
R1-141511	DL HARQ timing for FDD SCell in case of TDD PCell	NVIDIA	
R1-141518	Remaining issues for TDD-FDD CA	ITL Inc.	
R1-141527	DL HARQ timing for self-scheduled FDD Scell in case of TDD Pcell	Nokia, NSN	
R1-141586	Support of TDD as Primary Cell for TDD-FDD CA in Rel-12	Huawei, HiSilicon	
R1-141602	Remaining details of HARQ self-scheduling for TDD-FDD CA	Texas Instruments	
R1-141610	Discussion on supporting of TDD Pcell and DL HARQ timing for TDD Pcell	CMCC	
R1-141621	Discussion on self-scheduling PDSCH timing in TDD-FDD CA	Potevio	
R1-141626	DL HARQ timing for self-scheduling in case of TDD PCell	KT Corp.	
R1-141634	Views on HARQ timing for TDD Pcell	Ericsson	

7.2.4 Small Cell Enhancements – Physical-layer Aspects

WID in RP-132073.

7.2.4.1 Higher order modulation

Mr Chair's recommendation: Specification of 256QAM in downlink transmission, with focus on detailed design of MCS/CQI/TBS table, design of 256QAM related signalling, and adjustment on UE category

CQI/MCS/TBS Table

R1-141120	Further discussions on CQI/MCS table design for 256QAM	Huawei, HiSilicon	

Decision: The document is noted.

R1-141121	TBS table design for 256QAM	Huawei, HiSilicon	

Decision: The document is noted.

R1-141151	CQI Table for 256QAM Support	Intel Corporation	

Decision: The document is noted.

R1-141184	Support of 256QAM for small cells	CATT	

Decision: The document (Sections 2.1/2.2/2.3 only) is noted.

R1-141284	MCS/CQI/TBS table design for 256QAM	Samsung	

Decision: The document is noted.

R1-141337	CQI/MCS/TBS table design for 256QAM support	LG Electronics	

Decision: The document is noted.

R1-141529	Further details on CQI table design	Nokia, NSN	

Decision: The document is noted.

R1-141565	CQI table and feedback design for 256 QAM	Broadcom Corporation	

Decision: The document is noted.

R1-141636	CQI and MCS table design for downlink 256QAM	Ericsson	

Decision: The document is noted.

R1-141639	256QAM configuration and signalling	Ericsson	

Decision: The document is noted.

R1-141797	WF on 256QAM table design	Huawei, HiSilicon, CATR, LGE, Fujitsu, Ericsson, Broadcom, Blackberry, InterDigital, Samsung, CMCC	

Decision: The document is noted. Also supported by III

Agreements:

- Switching point of 64QAM and 256QAM should be CQI 15 in the existing table
  - The modulation order of existing CQI 15 is changed to 256QAM
- Working assumption: down-sample low CQI entries by removing 3 QPSK entries, and add 3 new entries for 256QAM region
  - Revisit if problems if significant issues are found
  - The 3 entries to be removed are either {#1, #3, #5} or {#2, #4, #6}
  - The last 4 entries will be for 256QAM, but the actual SE is FFS
- Order the CQI indices in the Rel-12 CQI table according to the spectral efficiencies

- 256QAM is supported for up to 8-layer PDSCH transmissions
- TBS table
  - Define overhead assumption(s) (REs/PRB) for PDSCH
    - Use 120 REs per PRB for all 256QAM spectral efficiencies except for the highest spectral efficiency
    - Use 136 REs per PRB for the highest spectral efficiency
  - Limit the number of new TBS values as much as possible
- DCI format 1A and DCI format 1C are associated with the legacy MCS table, i.e., not supporting 256QAM PDSCH scheduling
- For all other DCI formats scheduling PDSCH, 256QAM can be supported
- 256QAM PDSCH scheduling is only supported for C-RNTI based PDSCH transmissions
- FFS whether or not 256QAM is supported for PMCH transmissions
- MCS Table
  - 7 explicit MCS entries for 256QAM
  - As a working assumption, the # of implicit entries is 4 (for QPSK, 16/64/256QAM re-transmissions)
    - Revisit if significant issues are found

R1-141786	WF on MCS indexing for 256QAM Modulation and TBS index table	Intel Corporation, Motorola Mobility, CATT, Samsung	

Decision: The document is noted.

Proposals:

- Alt 1: For 256QAM Modulation and TBS index table keep the MCS indices the same for the entries, which are preserved from Rel-8 Modulation and TBS index table
  - Supported by: Intel Corporation, Motorola Mobility, CATT, Samsung, CMCC
  - Objected by: HW, HiSilicon
- Alt 2: For 256QAM Modulation and TBS index table, the MCS indices are ordered based on spectral efficiency
  - Supported by: HW, HiSilicon, Ericsson, LGE, Nvidia, Blackberry, ALU, ASB, Qualcomm, ZTE, Nokia, NSN, CATR, KT, Panasonic
  - Objected by: Intel

R1-141803	WF on 256QAM configuration	LG Electronics, Fujitsu, Blackberry, Qualcomm, Hitachi, Huawei, HiSilicon, Samsung, Broadcom, Panasonic, InterDigital	(R1-141792)

Decision: The document is noted.

Conclusion:
- In TM10, decide in RAN1#77 between the following alternatives:
  - Alt 1: CQI table can be CSI process dependent and MCS table can be PQI dependent
  - Alt 2: CQI table is common for all CSI processes and MCS table is common for all PQI sets
  - Alt 3: CQI table can be CSI process dependent and MCS table is common for all PQI states
- FFS, decide in RAN1#77 between the following two alternatives
  - Alt 1: the use of 256QAM CQI table can be configured for each measurement subframe set
  - Alt 2: the use of 256QAM CQI table can be configured is common for all measurement subframe sets

Gray Mapping

R1-141635	Gray mapping for 256QAM	Ericsson	

Decision: The document is noted.

Working assumption (Revisit in RAN1#77):
- Adopt binary reflected Gray mapping for 256QAM shown as follows:

$$\frac{1}{\sqrt{170}}\{(1-2b_i)[8-(1-2b_{i+2})[4-(1-2b_{i+4})[2-(1-2b_{i+6})]]] + j(1-2b_{i+1})[8-(1-2b_{i+3})[4-(1-2b_{i+5})[2-(1-2b_{i+7})]]]\}$$

UE Category/Capability

Thursday 3rd

R1-141879	WF on 256QAM UE Category handling	Ericsson, CMCC, CATR, Huawei, HiSilicon, Samsung, Blackberry, Fujitsu, III, FiberHome, CATT, Coolpad, China Unicom	(R1-141808)

The document was presented by Yu Yang from Ericsson.
- 256QAM is supported in existing UE categories 3-10
  - The field "Total number of soft channel bits" is not changed
  - Update two fields in UE category "Maximum number of DL-SCH transport block bits received within a TTI" and "Maximum number of bits of a DL-SCH transport block received within a TTI" to support 256QAM peak data rate
- Use one UE capability bit to signal the new processing capabilities
- At least one new UE category with 256QAM is introduced
  - ~4Gbps targeting 5CC, 8 layer MIMO with 256QAM
  - FFS introduce other new UE categories with 256QAM

Discussion: Also supported by AT&T, China Telecom, NVIDIA.
Decision: The document is noted. Continue discussion until RAN1 #77 meeting

Not treated.

R1-141122	Discussion on UE category with introduction of 256QAM	Huawei, HiSilicon	
R1-141152	MCS and TBS Tables for 256QAM Support	Intel Corporation	
R1-141153	Discussion on configuration aspects for 256QAM	Intel Corporation	
R1-141212	MCS Indication for 256QAM	Panasonic	(R1-140502)
R1-141213	CQI Table Design for 256QAM	Panasonic	
R1-141223	Discussion on 256QAM configuration	Fujitsu	
R1-141244	Consideration of 256QAM	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-141285	UE category/capability for 256QAM	Samsung	
R1-141286	Discussion on 256QAM related signalling/procedure	Samsung	
R1-141338	Further details on 256QAM operation	LG Electronics	
R1-141366	Discussion on CQI/MCS table design for 256QAM	FiberHome	
R1-141376	Higher Order Modulation for Small Cell Enhancement	HTC	
R1-141393	Discussion on Mechanism to Support 256QAM in TM 10	Hitachi Ltd.	
R1-141440	Higher order modulation	Qualcomm Inc.	
R1-141463	Further design of CQI/MCS table for 256 QAM	NTT DOCOMO	
R1-141501	MCS table design for 256 QAM	Broadcom Corporation	

R1-141512	CQI table design for downlink 256QAM	NVIDIA	
R1-141530	On 256QAM PDSCH support scheduled by compact DCI formats	Nokia, NSN	
R1-141531	On UE categories for 256QAM support	Nokia, NSN	
R1-141553	Design considerations for 256QAM	InterDigital	
R1-141578	Consideration on Remaining Issue to Configure 256 QAM	BlackBerry UK Limited	
R1-141579	New UE Category to Support 256 QAM	BlackBerry UK Limited	
R1-141607	MCS and TBS signalling for support of 256-QAM	Motorola Mobility	
R1-141608	UE category in support of 256-QAM	Motorola Mobility	
R1-141611	Configuration and MCS table design for higher order modulation	CMCC	
R1-141612	Considerations on UE category supporting 256QAM	CMCC	
R1-141637	TBS table design for downlink 256QAM	Ericsson	
R1-141638	On 256QAM UE category handling	Ericsson	
R1-141718	On standard impacts of 256QAM in downlink	ZTE	(R1-141399)
R1-141728	Design of CQI/MCS/TBS table for 256QAM	KT Corp.	(R1-141627)
R1-141800	Discussions on UE Categories with introduction of 256 QAM	Broadcom Corporation	(R1-141500)

7.2.4.2 Small cell on/off and discovery

Solutions for reduced transition time of small cell on/off in single-carrier or multi-carrier operation, with enhanced discovery of small cells

Not treated.

R1-141587	Other aspects related to small cell on/off and discovery	Huawei, HiSilicon	

7.2.4.2.1 Procedures for small cell on/off transition time reduction

Mr Chair's recommendation: Focus on only procedures for further reduction of small cell on/off transition time

R1-141483	On CA enhancements for fast small cell on/off operation	MediaTek Inc.	

The document was presented by Peikai Liao from MediaTek and proposes:
- Proposal 1: Introduce the following two enhancements for carrier aggregation:
  - New L1 activation/deactivation signalling
  - Discovery reference signal
- Proposal 2: A small cell should transmit discovery reference signal no matter it is in on or off state if discovery reference signal is configured for the small cell.
- Proposal 3: A UE should be configured single type of RRM measurements, either CRS-based or DRS-based RRM measurement, at least per carrier frequency. FFS single type of RRM measurements for one UE.
- Proposal 4: Further study the benefits to introduce subframe-level small cell on/off operation in carrier aggregation.

Decision: The document is noted.

R1-141268	Enhanced procedure for activated SCell operating on/off	China Telecom	

The document was presented by Xiaoming She from China Telecom and proposes:
- Proposal 1: the procedure illustrated in Fig.1 can be considered as the enhanced procedure for activated SCell operating on/off.
- Proposal 2: UE can acquire DRS pattern of SCell from PCell, e.g., timing and DRS periodicity.
- Proposal 3: PCell informs on-to-off and off-to-on transition of SCell via (e)PDCCH.

Decision: The document is noted.

R1-141214	The procedure for small cell on/off time transition (handover and DRX)	Panasonic	

The document was presented by Hidetoshi Suzuki from Panasonic and deals with the procedure related on/off time transition and the necessary modification related to the mobility and DRX. The required modification would be following.
- For RRM measurement, UE shall not assume other than discovery signal.
- For mobility procedure on connected mode (handover), everything can be realized by the network implementation. The eNB does not operate off when any of UEs in the coverage are handover procedure.
- For DRX, to specify " UE shall not assume any downlink transmission except a discovery signal in subframes which are not part of the Active Time ".

With above modifications, there is no additional delay caused by small cell on/off procedure. This includes the case that the small cell is PCell.

Decision: The document is noted.

R1-141288	UE RRM and synchronization procedures with small cell on/off operation	Samsung	

The document was presented by Thomas Novlan from Samsung and deals with potential impact on UE RRM and synchronization procedures based on PSS/SSS/CRS when operating small cell on/off.
- Observation: DRS and CRS may have better signal quality than PSS/SSS in a dense small cell deployment scenario.
- Proposal 1: UE may synchronize to a cell using CRS and DRS, instead on PSS/SSS when the cell is ON. The DRS of the cell may be assumed to be quasi co-located with the CRS/PSS/SSS in terms of delay spread, Doppler spread, Doppler shift, average gain, and average delay by the UE.
- Proposal 2: UE should attempt CRS RRM/ synchronization procedure to a cell if the cell is determined to be ON, and suspend CRS RRM/synchronization procedure to the cell otherwise.

Decision: The document is noted.

Mr Chair made the following proposal:
Followings are the potential UE monitoring behaviors for serving cell when DRS is configured for a UE
- Alt.1: Legacy RRM measurement/reporting for on-state small cells and DS-based measurement/reporting for off-state small cells
- Alt.2: DS-based measurement/reporting always when DS is configured

Motorola, Samsung and others: let's look to other contributions before trying to draw such proposal.

R1-141609	Further discussion on procedures for small cell on/off	Motorola Mobility	

The document was presented by Ravikiran Nory from MotM and provides a comparison of the CA activation/deactivation based ON/OFF scheme with the "fast ON/OFF" schemes proposed in [R1-140758],[R1-140452].

Decision: The document is noted.

R1-141640	On transition time reduction for small cell on/off	Ericsson	

The document was presented by Ms Sorour Falahati from Ericsson and proposes:
- Autonomous cell on/off state detection by the UE based on the CRS should be considered as a means to achieve the greatest transition time reduction.
- The periodicity of the discovery burst containing discovery signals should be configurable.
- Reference signals configured for a UE for CSI feedback and QCL properties may occur in a subframe containing discovery signals or in a subframe without any discovery signals.

Discussion: Broadcom→ max off period? eNB decision according to Ericsson

Decision: The document is noted.

R1-141858	WF on Reduced Transition Times for Small Cells on/off	Ericsson, Qualcomm , InterDigital, CATT, NTT DoCoMo, LG Electronics	

The document was presented by Ms Sorour Falahati from Ericsson.
- A new L1 procedure to further reduce the transition times is supported for small cell on/off.
- In the new L1 procedure, cell on/off status is indicated to the UE
  - Down-select whether the indication is sent on the serving SCell operating on/off or on the PCell
  - Candidates for the indicator are
    - DCI message
    - Reference signal
  - Down-select the value of the delay between the indicator and its corresponding first on subframe, within the range of 0 to 4 ms
  - Define the number of consecutive on subframes associated with the indicator
    - FFS: Whether the number of on subframes can be signaled with the indicator

Discussion:
Samsung: unclear how first bullet can get agreed at this stage. What is the reliability impact of CSI feedback? What is the availability of CSI? What is UE behavior w.r.t number of on subframes in the last sub-bullet point?
CATT: delay 0 to 4 should be as low as possible
Motorola: What is the gain of transmission time reduction in CA scenario considering Pcell scheduling is available? What is the impact of reliability of DCI message base or RS signal base on/off indication? What is the impact of UE power consumption?
ALU: is the proposal only for CA case? Also not clear how the reference signal works? What is UE behavior for DCI message?
Broadcom: Gain is unclear even when Pcell scheduling is not available
Huawei: better than listing all the issues, email discussion
NSN: Agree with Motorola that gain of the candidate schemes is unclear. Practical feasibility of faster on/off transition time.
Panasonic: What is new L1 procedure?

Decision: The document is noted. Continue offline discussion until Thursday – (Ericsson)

Thursday 3rd

Ericsson suggested removing first bullet [A new L1 procedure to further reduce the transition times is supported for small cell on/off] and indicated that clarifications for the listed issues have been made via email.

R1-141878	WF on Reduced Transition Times for Small Cells on/off	Ericsson, Qualcomm , InterDigital, CATT, NTT DoCoMo, LG Electronics, ITL. Inc.	(R1-141858)

The document was presented by Ms Sorour Falahati from Ericsson.

- Candidates for the new L1 procedure for activated SCell to further reduce the transition time
  - Information on what UE can assume about the cell transmission is indicated to the UE
    - Candidates for the indicator are
      - DCI message
      - Reference signal
      - Active time within the DRX procedure
      - Enhanced CA activation/deactivation command
    - For the DCI message and reference signal candidates
      - Down-select whether the indication is sent on the serving SCell operating on/off, on the PCell
      - Down-select the value of the delay between the indicator and its corresponding first on subframe, within the range of 0 to 4 ms
      - Define the number of consecutive on subframes associated with the indicator
        - » FFS: Whether the number of on subframes can be signaled with the indicator
      - Maximum number of consecutive off subframes is less than periodicity of configured signals such as DRS or CSI-RS.
    - For candidates based on active time within the DRX procedure
      - Define whether there should be a separate DRX configuration for the serving cell operating on/off different from the DRX configuration on other serving cells not operating on/off
      - Down-select timers related to DRX configuration to support on/off
  - For off subframes, UE assumes that the cell transmits a discovery signal in some of the off subframes. No transmissions are made in other subframes except for explicitly configured transmissions.

Discussion: NSN re-emphasized the need for RAN1 to decide whether a new L1 procedure is needed.

Huawei suggested drawing kind of guidelines until next meeting and use the outcomes of email discussion RAN1 already had, actually the list of topics to be clarified.

Decision: The document is noted and further revised in R1-141884, including above track changes and below information:

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The following aspects should be clarified for both on and off states for each of the candidates

- Transition time between on/off states and the definition of transition time used
- On/off granularity, i.e., any minimum-on-time (after transition from off to on state) and minimum-off-time (after transition from on to off state) restriction
- Assumptions on data availability/location (e.g., at eNB MAC buffer)
- Assumptions on CSI availability
- assumptions on TA availability
- Assumptions on DRX status (for example, no DRX configuration)
- Assumptions on PDCCH or EPDCCH reception at UE
- Assumptions on the availability of RRC RRM measurement (RSRP/RSRQ) at eNB
- Preferred criteria to trigger on/off transitions
- Specification impacts including any new UE behaviours/procedures needed, in addition to those already agreed until RAN1#76

Above aspects should also be clarified for any other procedures proposed for small cell on/off

Not treated.

R1-141154	Discussion on small cell on/off transition time reduction	Intel Corporation	
R1-141185	Procedures for small cell on/off transition time reduction	CATT	
R1-141245	System Design for transition time reduction for small cell ON/OFF	Aclatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-141287	Discussions on small cell on/off scenarios and procedures	Samsung	
R1-141339	Detailed design of small cell on/off operation	LG Electronics	
R1-141365	UE monitoring behaviour with cell on/off operations	FiberHome	
R1-141370	Discussion on small cell on off transition time reduction	New Postcom	
R1-141394	Explicit signalling of cell states to UEs	Hitachi Ltd.	
R1-141404	Enhanced small cell onoff mechanisms	ZTE	
R1-141405	Discussion on open issues of small cell on/off and discovery	ZTE	
R1-141441	Small cell on/off time reduction	Qualcomm Inc.	

R1-141464	Views on transition time reduction for small cell on/off	NTT DOCOMO	
R1-141484	On dual connectivity enhancements for fast small cell on/off operation	MediaTek Inc.	
R1-141496	Discussion on small cell on/off transition time reduction	III	
R1-141513	Procedures for reducing small cell on/off transition time	NVIDIA	
R1-141519	Discussion on the open issues of the enhanced small Cell on/off procedure	ITL Inc.	
R1-141554	Small cell On/Off mechanism	InterDigital	
R1-141588	New L1 procedure for small cell on/off transition time further reduction	Huawei, HiSilicon	
R1-141603	Procedures for small cell on/off transition time reduction	Texas Instruments	
R1-141613	Discussion on small cell architectures and procedures for small cell on/off and discovery	CMCC	(R1-140595)
R1-141641	Performance of small cell on/off with different transition times	Ericsson	
R1-141686	Transition Time Reduction for Small Cell On/Off	CEWiT	
R1-141720	Discussion on the open issues of small cell discovery	Coolpad	(R1-141236)
R1-141731	Small cell On/off procedures	Broadcom Corporation	(R1-141502)

7.2.4.2.2 Discovery signal(s) and measurements

Mr Chair's recommendation: Discuss down-selection of candidate discovery signals based on the corresponding evaluation results, discovery procedures including required network assistance information, and discovery signal-based RSRP and RSRQ-like measurements.

R1-141124	Reference signals for enhanced cell discovery	Huawei, HiSilicon	

The document was presented by David Mazzarese from Huawei and proposes:
- Proposal 1: ID of a neighbor cell is obtained from network assistance information and carried in the corresponding DRS signals
- Proposal 2: PSS + CSI-RS should be the basis for DRS design. Optimization for CSI-RS can be considered.

Decision: The document is noted.

R1-141719	Discussion on discovery signal design	CMCC	(R1-141614)

The document was presented by Xiaodong Shen from CMCC and proposes:
- Proposal 1: PSS is used for coarse time synchronization. And the corresponding *network assistance information* are as follows,
  - UE blind detection of PSS sequence without prior information from network side is preferred.
  - Indication of the time difference between start time of PSS of detecting cell and serving cell may be provided from network
- Proposal 2: Indication of the Cell identification information is necessary for small cell discovery. These information includes, e.g., cell IDs, virtual cell IDs for determine CRS/PRS/CSI-RS sequences.
- Proposal 3: Long period of RSRP measurement based on discovery signal should be considered without sacrificing the RSRP measurement performance.

Decision: The document is noted.

R1-141503	Small cell discovery signal design	Broadcom Corporation	

The document was presented by Ms Helka-liina Määttänen from Broadcom and concludes:
- Observation 1: The detection sequences should be present from all cells to be measured during the detection window.
- Observation 2: With aligned discovery signals all small cells that are potential target cells or interferers after HO may be detected efficiently.
- Observation 3: should be enough that UE receives knowledge on when to measure and eNB may not need to indicate UE the state of the neighbour cells to be measured via signalling.
- Proposal 1: Occurrences of the discovery burst are time aligned between the cells to be measured
- Observation 4: the existing PSS/SSS seem to be well suited for the timing search of cells as well as for cell identification and should be considered as part of discovery signal.
- Proposal 2: PSS/SSS/CRS based cell search sequences are preferred and totally different designs should prove benefits over PSS/SSS/CRS based discovery.
- Proposal 3: In addition to measurement requirements, discovery burst should enable settling of AGC before burst processing.

Decision: The document is noted.

R1-141290	Discussions on discovery reference signal based measurements	Samsung	

The document was presented by Thomas Novlan from Novlan and proposes some definitions of DRS-based RSRP (D-RSRP) and DRS-based RSRQ (D-RSRQ).
Decision: The document is noted.

R1-141852	WF on measurement assumptions with network assistance	LG Electronics, Broadcom, CMCC, Coolpad, ETRI, InterDigital, NEC, NTT DOCOMO, Panasonic, Qualcomm, ZTE	

The document was presented by Jonghyun Park from LGE.

- For enhanced discovery procedure:
  - A UE may assume that DRS is transmitted on both ON and OFF state.
  - UE can be configured with one DRS transmission configuration per frequency.
    - DRS transmission configuration includes at least period and offset.
      - The reference timing for the offset is the serving cell timing.
      - FFS how many configurations can be configured to a UE.
      - FFS additional information
  - UE can be configured with one legacy measurement gap configuration.
    - UE is not required to perform DRS-based inter-frequency measurement in non-measurement gap when measurement gap is configured.
    - FFS on additional measurement gap.

Decision: The document is noted, modified and the following is agreed:

Agreements:

- For enhanced discovery procedure:
  - UE can be configured with at least one DRS measurement timing configuration per frequency
    - Note: DRS measurement timing configuration indicates when UE may perform cell detection and RRM measurement based on DRS
    - Note: UE can detect multiple cells based on a DRS measurement timing configuration on the frequency
    - UE can expect DRS in DRS measurement timing configuration
    - DRS measurement timing configuration includes at least period and offset and potentially duration
      - The reference timing for the offset is a serving cell timing
        - FFS: Which serving cell

Possible agreements:

- UE can be configured with one DRS-based measurement gap configuration for DRS-based measurement
  - If a UE is configured with both legacy measurement gap and DRS-based measurement gap, DRS-based measurement gap should be subset of legacy measurement gap
  - FFS: Measurement gap is legacy pattern or new pattern
  - UE is not required to perform DRS-based inter-frequency measurement in non-measurement gap when measurement gap is configured
  - FFS on additional measurement gap

Continue offline discussion until Thursday – (LGE)

Thursday 3rd

R1-141865	WF on DRS measurement configuration	LG Electronics, CATT, ETRI, NEC, Qualcomm, ZTE	

The document was presented by Ms Yunjung Yi from LGE.

- UE can be configured with one measurement gap for DRS-based measurement when needed.
  - FFS: Measurement gap pattern is legacy pattern or new pattern
    - In case the measurement gap for DRS-based measurement is a legacy pattern, the UE can be configured with only one measurement gap.
    - In case the measurement gap for DRS-based measurement is a new pattern, the UE can be configured with up to two measurement gap patterns (one with a new pattern for DRS-based measurement and the other one with legacy pattern for legacy-based measurement). When two measurement gap patterns are configured, the configured measurement gap pattern for DRS-based measurement is a subset of the configured legacy measurement gap pattern.
  - UE is not required to perform DRS-based inter-frequency measurement in non-measurement gap when measurement gap is configured

Decision: The document is noted and the following WA is agreed:

Working assumptions:

- UE can be configured with one measurement gap for DRS-based measurement when needed
- Measurement gap can be used for making legacy measurement and DRS-based measurement based on configuration

R1-141854	WF on Small Cell Discovery Reference Signals	Intel, NSN, Nokia, MediaTek, ETRI, NVIDIA, NEC, InterDigital, Fujitsu, BlackBerry, Qualcomm, CATT	

The document was presented by Seunghee Han from Intel.

- A UE assumes both PSS and SSS are transmitted as a part of DRS occasion.
  - FFS for the additional reference signals as a part of DRS occasion among no RS, CRS, CSI-RS, and/or PRS
- A UE assumes DRS occasion comprising *N* instances is defined and the DRS occasion is periodically transmitted.
  - FFS for the definition of 'instance' (e.g. OFDM symbol, subframe, etc)
  - FFS for the exact values of *N*
  - FFS for the details on how to transmit DRS in the instances within a DRS occasion

Decision: The document is noted. Continue offline discussion until Thursday – (Intel)

Thursday 3rd

R1-141870	WF on Small Cell Discovery Reference Signals	Intel, NSN, Nokia, MediaTek, ETRI, NVIDIA, NEC, InterDigital, Fujitsu, BlackBerry, Qualcomm, CATT, Broadcom	(R1-141854)

The document was presented by Seunghee Han from Intel.

- A DRS occasion comprises *N* instances.
  - Both PSS and SSS are transmitted within the DRS occasion.
    - FFS for the additional reference signals within the DRS occasion among no RS, CRS, CSI-RS, and/or PRS
  - The *N* instances may contain different RS types.
  - FFS for the definition of 'instance' (e.g. OFDM symbol (s), subframe (s), etc)
  - FFS whether the instances are consecutive or not
  - FFS for the exact value of *N*
  - FFS on the details within the DRS occasion
- A UE assumes the DRS occasion is periodically transmitted.

Decision: The document is noted, modified and agreed as follows:

Agreements:

- A DRS comprises following signals
  - Both PSS and SSS are transmitted
  - Additional reference signal(s) include CRS and/or CSI-RS
- FFS: Changing mapping of PSS/SSS, CRS, CSI-RS

Possible agreements:

- DRS functions: RRM measurement, cell identification, TP identification, potentially new L1 procedure
- Down select of following alternatives of DRS
  - Alt. 1: At least CRS and CSI-RS if configured
  - Alt. 2: CRS, CSI-RS both with configurability
  - Alt. 3a: CRS
  - Alt. 3b: CSI-RS
  - Alt. 4: Both CRS and CSI-RS with the same transmission timing
  - Alt. 5: At least CSI-RS and CRS if configured

	- RRM measurement for cell - cell identification	- RRM measurement for TP - TP identification	
only CRS	CRS is used	how?	
only CSI-RS	Linkage between CSI-RS and CRS is signaled	CSI-RS	
both CRS and CSI-RS	CRS is used	CSI-RS is used	

Continue offline discussion until Thursday – (Huawei)

Possible functions of CRS and CSI-RS and open issues from offline discussion (Thurs afternoon coffee break):

- When only CRS is present
  - Possible functions of CRS: RSRP/RSRQ measurements, carry cell identification information, can carry TP identification information only in case of non-shared cell ID scenario, CSI feedback (potentially for new L1 procedure)
  - Open issue: TP identification in case of shared cell ID scenario
- When CRS and CSI-RS are present:
  - Possible functions of CRS: RSRP/RSRQ measurements, carry cell identification information, can carry TP identification only in case of non-shared cell ID scenario, CSI feedback (potentially for new L1 procedure)

  - Possible functions of CSI-RS: RSRP/RSRQ measurements, can carry cell identification information, can carry TP identification information in shared/non-shared cell ID scenario, CSI feedback (potentially for new L1 procedure)
  - Open issues:
    - possible function split
      - Note: It means that the same function is not supported by both CRS and CSI-RS for the same UE
    - TP identification in case of shared cell ID scenario by CRS
- When only CSI-RS is present
  - Possible functions of CSI-RS: RSRP/RSRQ measurements, can carry cell identification information, can carry TP identification information in shared/non-shared cell ID scenario, CSI feedback (potentially for new L1 procedure)
- Open issue:
  - whether/how to perform RSRP/RSRQ measurement per cell and per TP simultaneously
  - For RSRP/RSRQ measurements, CSI-RS and CRS have different performance
  - Note: There is at least one function per RS

R1-141881	WF on Discovery Signals functions	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Broadcom, CATT,CHTTL, Intel, Nokia, NSN, NVIDIA, Qualcomm	

The document was presented by Fang Chen Cheng from ALU.

- A Transmission Point (TP) is a cell with distinct PCID in small cell ON/OFF operation
  - DRS for identification of cell/Transmission point is to identify PCID

Decision: The document is noted.

R1-141882	WF on DRS design	NTT DOCOMO, Huawei, HiSilicon, Samsung, Hitachi, ETRI, Sharp, Sony, NTT, New Postcom, CATR, ZTE, InterDigital, KCME	

The document was presented by Hiroki Harada from NTT DoCoMo.

- Baseline for DRS is PSS/SSS/CSI-RS (Alt. 3b)

Discussion: NSN cannot agree with the proposed baseline.
Also supported by Panasonic (Wider band and/or TP deployment), MTK (DRS includes at least PSS/SSS/CSI-RS).
Decision: The document is noted.
Objected by NSN, Qualcomm, Intel, Broadcom, NVIDIA, AL, ASB, Nokia, CATT.

Possible agreements:

- Alt. 3a: DRS is PSS/SSS/CRS

Supported by NSN, Nokia, Intel, Broadcom, NVIDIA, AL, ASB, CATT, Mot. Mob., QCM, LG, MTK (DRS includes at least PSS/SSS/CRS)
Objected by Samsung, DCM, Panasonic (wider band and/or TP deployment), Huawei, HiSi, ZTE, Sharp

- Alt. 2: DRS is PSS/SSS/CSI-RS or PSS/SSS/CRS with configurable
- Alt. 5: DRS is PSS/SSS/CSI-RS/CRS or PSS/SSS/CSI-RS with configurable
- Alt. 1: DRS is PSS/SSS/CSI-RS/CRS or PSS/SSS/CRS with configurable

Possible conclusion:
Down select among above alternatives until Friday – (NTT DOCOMO)
Friday 4th : NTT DoCoMo→No consensus so far.
Mr Chair's hope was to down select at this meeting, if it cannot be done let's do it in RAN1#77.
Further down select attempt of the following alternatives of DRS:

- Alt. 1: DRS is PSS/SSS/CSI-RS/CRS or PSS/SSS/CRS with configurable
  - Supported by Fujitsu, Panasonic, MTK, LG (4)
  - Objected by ALU, ASB, Intel, Samsung (4)
- Alt. 3a: DRS is PSS/SSS/CRS
  - Supported by Fujitsu, QCM, AL, ASB, Broadcom, Intel, CATT, NVIDIA, NEC, Mot. Mob, NSN, Nokia, LG (13)
  - Objected by DCM, Samsung, HW, HiSi, ZTE, Sharp, Panasonic (7)
- Alt. 3b: DRS is PSS/SSS/CSI-RS
  - Supported by Samsung, Huawei, HiSi, DCM, Sharp, ETRI, ZTE, Sony, Hitachi, CATR (10)
  - Objected by CATT, NVIDIA, AL, ASB, Broadcom, NSN, Nokia, QCM (8)
- Alt. 5: DRS is PSS/SSS/CSI-RS/CRS or PSS/SSS/CSI-RS with configurable
  - Supported by Huawei, HiSi, ZTE, Samsung, DCM, InterDigital, Fujitsu (7)

- Objected by Intel, Nokia, QCM, AL, ASB, NVIDIA, Broadcom, CATT, LG (10)

Agreements:
- Further down select of following alternatives of DRS in RAN1 #77 meeting
  - Alt. 1: DRS is PSS/SSS/CSI-RS/CRS or PSS/SSS/CRS with configurable
  - Alt. 3a: DRS is PSS/SSS/CRS
  - Alt. 3b: DRS is PSS/SSS/CSI-RS
  - Alt. 5: DRS is PSS/SSS/CSI-RS/CRS or PSS/SSS/CSI-RS with configurable

R1-141859	WF on discovery signal design and network assistance	NTT DOCOMO, Huawei, HiSilicon, Samsung, Sony, Sharp, ZTE, LG Electronics, Hitachi, ETRI, MediaTek	

The document was presented by Hiroki Harada from NTT DoCoMo.
- In Rel. 12 discovery procedure, UE can assume transmission of CSI-RS in addition to PSS
  - CSI-RS can be used for cell/transmission point identification and for RSRP measurement
  - FFS whether UE can assume transmission of signal(s) other than PSS and CSI-RS in Rel. 12 discovery procedure
- Network assistance related to discovery RS configuration information is provided to UEs for Rel. 12 discovery procedure
  - Discovery RS configuration information includes at least:
    - Time/frequency resource configuration
    - Scrambling ID(s) of signals transmitted for Rel. 12 discovery procedure
    - QCL information between signals transmitted for Rel. 12 discovery procedure
- Support CSI-RS based RSRP/RSRQ measurement and reporting
  - FFS between following options
    - Option #1: CSI-RS based RSRP measurement is specified only for the case that measurement bandwidth is equal to or larger than 5 MHz
    - Option #2: New relaxed RAN4 requirement is defined for CSI-RS based RSRP measurement using 6 and 15 RBs
    - Option #3: Some enhancement of CSI-RS to meet current RAN4 requirement even in case of 6 RBs is introduced
  - RSRQ = N×RSRP/RSSI. For RSSI measurement, down-select from the following alternatives
    - Alt 1: RSRP + linear average of the total received power observed in OFDM symbols not including DRS within the measurement bandwidth
    - Alt 2: linear average of the total received power observed in all OFDM symbols within the measurement bandwidth
    - Alt 3: linear average of the total received power observed in OFDM symbols not including DRS within the measurement bandwidth
    - Alt 4: legacy RSSI measurement, i.e. it requires CRS transmission in discover RS

Decision: The document is noted.

Agreements:
- Rel. 12 discovery signal should identify transmission point
- Rel. 12 discovery signal should facilitate small cell on/off

Continue offline discussion w.r.t R1-141859 until Thursday – (NTT DOCOMO)

Thursday 3rd

R1-141868	WF on Small Cell on/off and Discovery enhancements	Huawei, HiSilicon, NTT DOCOMO, Samsung, ZTE, Sony, Sharp, Hitachi, ETRI, Mediatek	

The document was presented by David Mazzarese from Huawei.
- The Rel-12 enhanced discovery should enable cell/TP on/off operation in shared cell ID and non-shared cell ID scenarios
  - TPs are identified by different TPIDs
- The DRS enables the identification of TPID
  - Scrambling ID(s) of the signal(s) transmitted in the DRS relate to TPID
    - FFS whether/how PCID can also be identified from the scrambling ID(s) by the UE in shared cell ID scenarios
- A TPID/PCID related list can be configured to a UE for the Rel-12 enhanced discovery
- Rel-12 discovery based only on PSS/SSS/CRS with scrambling based on PCID is not sufficient
  - CSI-RS is used for the Rel-12 discovery

Discussion: Also supported by LGE.
Decision: The document is noted.

Possible agreements:

- The Rel-12 enhanced discovery should enable cell/TP on/off operation in shared cell ID and non-shared cell ID scenarios
  - TPs are identified by different TPIDs
- The DRS enables the identification of TPID
  - Scrambling ID(s) of the signal(s) transmitted in the DRS relate to TPID
    - PCID can also be identified from the scrambling ID(s) by the UE in shared cell ID scenarios
- At least TPID related list can be configured to a UE for the Rel-12 enhanced discovery
  - FFS: A PCID related list can be configured to a UE for the Rel-12 enhanced discovery
- Rel-12 discovery based only on PSS/SSS/CRS with scrambling based on PCID is not sufficient

Continue offline discussion until Friday – (Huawei)

Not treated.

R1-141123	UE monitoring behavior with DRS configurations	Huawei, HiSilicon	
R1-141125	Enhanced reference signals for small cell discovery and performance evaluation	Huawei, HiSilicon	
R1-141126	Support for DRS-based RRM measurements	Huawei, HiSilicon	
R1-141127	Network assistance for small cell discovery	Huawei, HiSilicon	
R1-141155	Simulation results for small cell discovery signal candidates	Intel Corporation	
R1-141156	Discussion on small cell discovery signal	Intel Corporation	
R1-141186	Design of discovery signal for small cells	CATT	
R1-141202	Views on network assistance for cell discovery	NEC	
R1-141203	Small cell discovery signal design	NEC	
R1-141215	Discussion on RSSI on RSRQ-like measurements	Panasonic	
R1-141224	Options for small cell discovery and RRM measurements	Fujitsu	
R1-141225	Discussion on RSRQ measurement for small cell on/off	Fujitsu	
R1-141246	Discovery signals design	Aclatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-141266	Discovery signal(s) and measurements	ETRI	
R1-141289	Discussions on small cell discovery procedure	Samsung	
R1-141291	Discussions on discovery reference signal design	Samsung	
R1-141326	Discovery signal design for small cell	Sharp	
R1-141340	Discovery signal design choices and considerations	LG Electronics	
R1-141341	Performance analysis on discovery signal candidates	LG Electronics	
R1-141395	Discussion on discovery signal candidates	Hitachi Ltd.	
R1-141396	Discovery Signal for Small Cells	Hitachi Ltd.	
R1-141413	On DS design - Including SSS as part of the DS signal	ZTE	
R1-141414	On DS design - Frequency division multiplexing	ZTE	
R1-141415	Autonomous time difference detection for extended small cell On/OFF use cases	ZTE	
R1-141416	Discovery burst indicator for autonomous time difference detection	ZTE	
R1-141417	On network assisted DS transmissions under uncertain relative time differences	ZTE	
R1-141442	Small cell discovery	Qualcomm Inc.	
R1-141465	Views on network assistance for Rel-12 discovery procedure	NTT DOCOMO	
R1-141466	Views on discovery signal design for Rel-12 discovery procedure	NTT DOCOMO	
R1-141467	Views on discovery signal-based RSRQ measurement	NTT DOCOMO	
R1-141485	On enhancements for small cell discovery and RRM measureements	MediaTek Inc.	
R1-141486	Performance evaluation of small cell discovery signal designs	MediaTek Inc.	
R1-141504	System level evaluations for aligned discovery	Broadcom Corporation	
R1-141505	RSRQ calculation for small cell On/Off	Broadcom Corporation	
R1-141514	Discovery signal design	NVIDIA	
R1-141532	Small Cell Detection Statistics and Related Considerations	NSN, Nokia	
R1-141533	Discovery Signals and Measurements	NSN, Nokia	
R1-141555	RSSI measurements in Small cell On/Off operation	InterDigital	

R1-141570	Discussion on small cell discovery signal design	Sony	
R1-141574	UE measurement based on discover signal	ASUSTeK	
R1-141589	Mechanisms for energy-efficient small cell discovery and measurements	Huawei, HiSilicon	
R1-141642	Design of discovery bursts and procedures	Ericsson	
R1-141643	Performance of discovery burst options	Ericsson	

7.2.4.3 Radio-interface based synchronization

Mr Chair's recommendations: Solutions for network listening in single-carrier or multi-carrier operation, to support multiple stratum level beyond 3 hops, e.g. 4 to 6 hops, to improve the achievable synchronization accuracy, and to be applicable to small cell on/off, eIMTA and inter-operator TDD deployment in the same band. Focus on the standard impacts.
Note: Complete RAN1 part of radio interface based synchronization in Q2-2014

R1-141406	Solutions and standard impacts for RIBS	ZTE	

Decision: The document is noted.

R1-141443	Network synchronization by network listening	Qualcomm Inc.	

Decision: The document is noted.

R1-141616	Discussion on radio interface based inter-operator synchronization	CMCC	

Decision: The document is noted.

Not treated.

R1-141128	Standards impacts by supporting muting and not turning off listening RS	Huawei, HiSilicon	
R1-141129	Network listening RS design options	Huawei, HiSilicon	
R1-141130	Discussion on network listening with eIMTA	Huawei, HiSilicon	
R1-141187	Radio-interface based synchronization for small cells	CATT	
R1-141247	System analysis of Radio Interface Based Synchronization (RIBS)	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-141342	Design of radio-based network synchronization for intra-operator scenarios	LG Electronics	
R1-141343	Design of radio-based network synchronization for inter-operator scenarios	LG Electronics	
R1-141367	Small cell on-off switching and muting in radio interface based synchronization	FiberHome	
R1-141407	Issues regarding radio-interface based synchronization	ZTE	
R1-141477	Further discussion on radio-interface based synchronization	ITRI	
R1-141534	Designing issues of Radio-interface based Synchronization	NSN, Nokia	
R1-141535	RIBS with Synchronization Accuracy Indication	NSN, Nokia	
R1-141590	Discussion on network listening for intra/inter-operator deployment	Huawei, HiSilicon, CATR	
R1-141615	Radio-interface based synchronization for intra-operator small cells	CMCC	
R1-141644	Scenarios and solutions for radio-interface based synchronization	Ericsson	

Wednesday 2nd

R1-141856	Way forward on RIBS	Huawei, HiSilicon, CMCC, Deutsche Telekom, AT&T, Telecom Italia, CATR, IAESI, T-Mobile USA	

The document was presented by Ms Elean Fan from Huawei.

- Motivation 1: the same listening RS design should be used in the network applying network listening and muting. It is difficult to rely on implementation to achieve the same design across different vendors.
- Proposal 1: Specify listening RS including per subframe RS pattern, periodicity, and offset, for both FDD and TDD

- Motivation 2: For inter-operator synchronization, it cannot be assumed that all the cells are synchronized to the predefined absolute timing with required accuracy(e.g., 3us) by using enough number of GNSS as well as network listening among the cells of the same operator.
- Proposal 2: Network listening between the cells of different operators operating in the same TDD band needs to be supported

Decision: The document is noted.

Agreement:
- Specify listening RS(s) including RS pattern, and subframe periodicity, and offset, for both FDD and TDD
  - Other specification impacts are FFS

Possible observation:
- Network listening between the cells of different operators operating in the same TDD band needs to be possible
  - FFS: Standard impact

Continue offline discussion until Thursday – (Huawei)

Thursday 3rd

R1-141880	Proposals on RIBS for inter-operator synchronization	CMCC, Huawei, HiSilicon, Potevio, Deutsche Telekom, CATR, IAESI, CHTTL	

The document was presented by Xiaodong Shen from CMCC.
- Network listening between the cells of different operators operating in the same TDD band is beneficial in some scenarios and should not be precluded
  - Whether standard impact is needed is FFS
- Observation 1: For inter-operator synchronization, an operator may not have access to enough GNSS or backhaul based time reference in some areas.
- Observation 2:For inter-operator synchronization, it cannot be assumed that all the cells are synchronized to the predefined absolute timing with required accuracy(e.g., 3us) by using enough number of GNSS as well as network listening among the cells of the same operator.

Decision: The document is noted and agreed

R1-141801	Way Forward on RIBS	ZTE, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, CHTTL, Ericsson, FiberHome, ITRI, NSN, Samsung	

The document was presented by Huaming Wu from ZTE.
- CRS is used as the listening RS for RIBS
- Information on the RIBS listening RS transmission subframe(s) is exchanged via backhaul signaling
  - Subframe-level muting is supported for RIBS.
- Send LS to RAN3 to consider how to specify the above.

Discussion: Huawei→ premature to state "backhaul signalling" at this stage – may not be used at all.
LGE not sure what RAN3 will do with RAN1 LS → if LS still to be sent, change the wording to "Muting can be supported for RIBS".
NSN suggested to rephraze it as"Subframe-level muting to support MBSFN-based RIBS
Huawei: how long is the listening periodicity? is key question – PRS could be an option

Decision: The document is noted, modified and the following is agreed.

Agreements:
- PRS and/or CRS is used as the listening RS for RIBS
  - FFS: Down-select of listening RS
- Subframe-level muting is supported for RIBS
- FFS: In RAN1, UE impact of detailed subframe-level muting

Prepare draft LS (R1-141883) to RAN3 that captures all meeting agreements under A.I. 7.2.4.3 until Friday – (ZTE), (Huawei)

Friday 4th

R1-141883	[DRAFT] LS on status of Radio-interface based synchronization	ZTE, Huawei	R1-141892

The document was presented by Huaming Wu from ZTE.

Decision: The document is noted and final LS is agreed in R1-141892.

7.2.5 Physical layer functionalities required for operation of Dual Connectivity

WID in RP-132069.

Mr Chair's recommendations: Main focus on UL simultaneous transmission and its related TPC aspects and details of UCI feedback mechanisms.

Agreements in RAN1 #76:

- At least following schemes are supported
  - At least the following, uplink control information (UCI) related to the PDSCH/PUSCH operation in SCG is transmitted to the SeNB only
    - HARQ-ACK for PDSCH of SCG cells
    - Periodic and aperiodic CSI of SCG cells
  - HARQ-ACK and CSI related to MCG is transmitted to the MeNB only
  - In SCG, the UCI transmission rules as in Rel-11 are supported, with the Pcell replaced by the pSCell:
    - Physical channel (PUCCH or PUSCH) in which UCI is transmitted
      - Selection of the cell in which UCI is transmitted in case of UCI on PUSCH
      - Selection of PUCCH resources for HARQ-ACK
    - Periodic CSI dropping rules
    - Handling of UCI combinations
    - HARQ-ACK timing and multiplexing

R1-141188	UCI transmission for dual connectivity	CATT	

The document was presented by Zukang Shen from CATT and deals with the details of UCI transmission on SCG for dual connectivity, and proposes:

- Proposal 1: In Rel-12 dual connectivity, UCIs for MCG are transmitted to MeNB only and UCIs for SCG are transmitted to SeNB only.
- Proposal 2: UCI transmission schemes are independent configured for MCG and SCG.
- Proposal 3: PUCCH can only be transmitted on the PCell in MCG and the pSCell in SCG.

Discussion: Panasonic→ Simultaneous PUCCH and PUSCH transmissions are FFS.
NEC→ concern with proposal 3.
Decision: The document is noted.

R1-141295	Utilization of UE Capabilities in Dual Connectivity	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes:

- Proposal 1: CSS support for a UE exists on both the MeNB and the SeNB.
- Proposal 2: A UE can be configured to include HARQ-ACK information for both MeNB and SeNB in a PUCCH.
- Proposal 3: The MeNB can inform the SeNB of a maximum total UE processing capability at the SeNB.
- Proposal 4: The MeNB and the SeNB should exchange configurations that determine subframes where a UE cannot transmit UL signalling or receive DL signalling in the respective eNB.

Decision: The document is noted.

R1-141537	Control signalling for dual connectivity	NSN, Nokia	

The document was presented by Jari Lindholm from NSN and proposes:

- Proposal 1: UE shall monitor common search space also on the pSCell at least for random access response and UL-DL reconfiguration signalling (if eIMTA is used).
- Proposal 2: Additional UCI transmission methods are not needed besides of what was agreed in the last meeting.
- Proposal 3: Scheduling request transmission in pSCell is supported in the dual connectivity.

Decision: The document is noted.

Potential agreements:

- Scheduling request (SR) transmission is supported on both MCG and SCG
  - It has no impact to RAN2 future decision related to SR
    - AL, Intel: SR related transmission scheme should be discussed in RAN2
    - Panasonic: SR is "SR over PUCCH"
    - CATT, ZTE: Support above bullet. This is independent from RAN2.

Continue offline discussion until Thursday – Jarri (NSN)

Agreements:

- With the agreement in RAN1 #76, following UCI feedback mechanisms are supported in Rel-12 dual connectivity
  - In dual connectivity, UEs feedback UCI (SR, HARQ-ACK, CSI) related to MCG to MeNB only
  - In dual connectivity, UEs feedback UCI (SR (if supported), HARQ-ACK, CSI) related to SCG to SeNB only
  - For each UCI feedback, non-dual connectivity based UCI feedback mechanisms using PUCCH/PUSCH are applied within each cell group

- In dual connectivity, in MCG, PUCCH for MCG is supported in Pcell only, while PUCCH for SCG is supported in pSCell only

Thursday 3rd

R1-141860	Conclusions of the offline discussion on SR on pSCell PUCCH	NSN	

The document was presented by Jari Lindholm from NSN and draws the conclusions of the offline discussion:
- From RAN1 point of view it is beneficial to support SR in the pSCell
- RAN2 already now assumes that SR is supported in the pSCell

Proposals
- RAN1 agrees or makes WA that SR transmission is supported on the pSCell
- Discuss if LS should be sent to RAN2 to check if they see any problems in the RAN1 decision

Discussion: ALU → progress in RAN1 can still continue without waiting RAN2 feedback
Decision: The document is noted.

Working assumption:
- SR transmission is supported on the pSCell
- Prepare draft LS to RAN2 (R1-141864) to check if they see any problems with RAN1 decision – (NSN)

R1-141864	[Draft] LS on the scheduling request transmission on the pSCell	NSN	

Decision: The document is noted and agreed in R1-141869 (with correction of WI code).

Power control

R1-141293	UL Power Control in Dual Connectivity	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes:
- Proposal 1: For a UE, the MeNB informs the SeNB of a maximum power P_{CMAX_SeNB} the SeNB can assign to cells it configures for UL transmissions from the UE.
- Proposal 2: The MeNB and the SeNB exchange patterns informing whether a UE has or does not have UL transmissions. These patterns include DRX patterns, periodic PUSCH or PUSCH transmissions patterns, measurement gaps, TDD UL-DL configuration(s), etc.
- Proposal 3: Consider additional power scaling methods, other than equal power scaling, for operation under UL transmission power limitation.
- Proposal 4: Consider prioritization rules taking into account partial overlapping between subframes.

Decision: The document is noted.

R1-141216	Power control on dual connectivity	Panasonic	

The document was presented by Hidetoshi Suzuki from Panasonic and proposes
- Proposal 1: The network configures the maximum power UE is allowed to use for uplink transmissions to MeNB and SeNB respectively via RRC or MAC. At least when MeNB and SeNB are not synchronized in the order of CA, the sum of two power is equal to or lower to P_{cmax}..
- Proposal 2: Dual connectivity UE should report to an eNB extended PHR for the serving cell controlled by this eNB and virtual PHR for the cell controlled by other eNB.

Decision: The document is noted.

At this stage, NTT Docomo raised the following observations:
- There are several high-level proposals regarding TPC and power-limited definition/handling of dual connectivity
- Alt.1 Power-sharing between MCG and SCG
  - Maximum transmit power per CG/eNB is not configurable
  - New power scaling/dropping rules are needed
  - Question1 : This is for sync case only? or for both sync and unsync cases?
  - Question2 : What is UL channel/signal prioritization rules?
- Alt.2 Power-splitting between MCG and SCG
  - Maximum transmit power per CG/eNB is configurable
  - Question1 : This is for sync case only? or for both sync and unsync cases?
  - Question2 : All UL channels need to follow the configured power in any cases?
- Alt.3 Configurable b/w power-sharing and power-splitting between MCG and SCG
  - Maximum transmit power per CG/eNB is configurable
  - Power-splitting is allowed by setting P_MeNB + P_SeNB <= P_UE
  - Power-sharing is allowed by setting P_MeNB + P_SeNB > P_UE
  - Question1 : All UL channels need to follow the configured power in any cases?
  - Question2 : What is UL channel/signal prioritization rules?
  - Question3: How to accommodate unsync case?

Discuss offline – these issues are for further considerations and will be re-addressed later in the week. Offline discussion should also considered the following.

R1-141741	WF on power control for Dual Connectivity	LGE, Fujitsu, NEC	

The document was presented by … from LGE.

- For UE UL power allocation across different eNBs,
  - Without introducing per-eNB configurable maximum power, rely on the existing UE-determined maximum power per serving cell $P_{CMAX,c}$, and the total maximum power P_{CMAX}
    - FFS for power scaling across eNBs for power limited case

Discussion: Samsung→ similar to Alt.1 in DoCoMo's observations.
Decision: The document is noted. Continue offline discussion until Thursday – (NTT DOCOMO)

Thursday 3rd

R1-141863	Outcome of the offline discussion on TPC aspects of Dual Connectivity	NTT DoCoMo	

The document was presented by Fred Takeda from NTT DoCoMo. Although primary goal was to identify potential TPC solutions for dual connectivity, number of issues were raised due to different understandings/assumptions for power-limited handling.
Decision: The document is noted. Email discussion/approval until 24th April about R1-141863 including following question – (NTT DOCOMO)

- Question(#7): Is $P_{cmax,c}$ available in dual connectivity?

(Email discussion/approval plan)
Until 10th April: To identify other questions and clarify the existing ones.
Until 24th April: To make common understandings within RAN1 including potential LS to RAN4 (if necessary)

R1-141861	Proposal on maximum power definition in dual connectivity	LG Electronics	

The document was presented by Joon Kui Ahn from LGE and proposes the following as an assumption for further work on UL PC in dual connectivity:

- RAN1 assumes that $P_{CMAX\_L\_CA}$ value can be different for each overlap portion of UL subframes when UL transmissions between MeNB and SeNB partially overlap in asynchronous case.
- Based on the assumption above, how to define the power-limited case and how to decide a transmission power of a physical channel in a subframe when power-limited is to be discussed further
- If deemed necessary, send an LS to RAN4 to confirm if the above assumption is relevant.

Discussion: NEC suggested sending LS to RAN4 to ask feedback on figure 1 of R1-141861 (see below).
Decision: The document is noted.

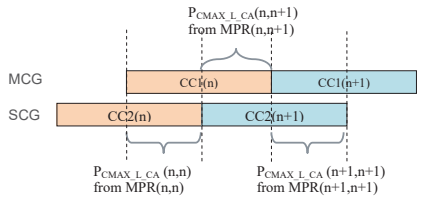


Figure 1. Illustration of maximum transmit power in dual connectivity

NEC and ZTE proposal

- RAN1 would like to know whether $P_{CMAX\_L\_CA}$ can changed in different overlap region as shown in Fig. 1
  - Note that CC1(n+1), CC1(n), CC2(n), and CC2(n+1) can have a different number of RBs and modulation orders
- Prepare draft LS to RAN4 to ask above question

LG and Panasonic proposal

- Some RAN1 companies understand that $P_{CMAX\_L\_CA}$ value can be different for each overlap portion of UL subframes when UL transmissions between MeNB and SeNB partially overlap in asynchronous case.
- Based on the assumption above, how to define the power-limited case and how to decide a transmission power of a physical channel in a subframe when power-limited is to be discussed further
- Prepare draft LS to RAN4 to confirm if the above understanding is correct.

Interdigital: doesn't see which RAN1 decision depends on the response to LS
LGE: Can RAN1 agree on "$P_{CMAX\_L\_CA}$ value can be different"?

Ericsson: Both synchronous and asynchronous are important for DC. Ok with NEC proposal by replacing $P_{CMAX\_L\_CA}$ to P_{CMAX}
Qualcomm:
(Q1) Whether power control changes are allowed one carrier in the middle of subframe?
No: MotM (It brings other issues(e.g., transient period and gap)), Qualcomm (Agree with MotM – If we change the power between DM-RS and data, then 16QAM can not be decoded. DM-RS OCC does not work)
(Q2) If not (Q1), then power setting should depend on multiple overlapping subframe or not

Working assumption:

- Power control changes are not allowed one carrier in the middle of subframe in asynchronous case in dual connectivity

Possible proposal from TDD-FDD CA WI:
Note: TDD Pcell and FDD Scell with TDD FDD CA can be discussed in the Rel-12 dual connectivity WI

Not treated.

R1-141131	Power headroom report for dual connectivity	Huawei, HiSilicon	
R1-141132	Physical layer impact of Dual Connectivity - Downlink	Huawei, HiSilicon	
R1-141133	Uplink channel transmission of Dual connectivity	Huawei, HiSilicon	
R1-141134	Uplink Power allocation in Dual connectivity	Huawei, HiSilicon	
R1-141157	Physical layer impact due to dual connectivity	Intel Corporation	
R1-141189	Uplink power control for dual connectivity	CATT	
R1-141204	UL power control and splitting in dual connectivity	NEC	
R1-141205	On UE capabilities defined as UE category for dual connectivity	NEC	(R1-140420)
R1-141226	Physical layer issues of dual connectivity	Fujitsu	
R1-141227	Power allocation strategy for power limited UE in dual-connectivity	Fujitsu	
R1-141737	UL power control and power scaling for dual connectivity	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	(R1-141248)
R1-141249	Common search space on SeNB for dual connectivity	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-141250	UE capability sharing between MeNB and SeNB for dual connectivity	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-141269	UL Power transmission for dual connectivity	China Telecom	
R1-141292	Parallel random access preamble transmissions in dual connectivity	Samsung	
R1-141294	UCI Transmission in Dual Connectivity	Samsung	
R1-141344	Power control for dual connectivity	LG Electronics	
R1-141345	Remaining RAN1 issues of dual connectivity	LG Electronics	
R1-141363	PDCCH common search space in SCG	CATT	
R1-141364	UE category related L1 processing capability for dual connectivity	CATT	
R1-141372	Discussion on physical layer functionalities for Dual Connectivity	New Postcom	
R1-141378	Physical Layer Aspects of Dual Connectivity	HTC	
R1-141401	Physical layer aspects of dual connectivity	ZTE	
R1-141402	UCI feedback mechanism for dual connectivity	ZTE	
R1-141403	Parallel random access preamble transmissions in dual connectivity	ZTE	
R1-141444	Physical layer aspects of dual-connectivity	Qualcomm Inc.	
R1-141468	Open issues on dual connectivity	NTT DOCOMO	
R1-141469	Transmit power control for dual connectivity	NTT DOCOMO	
R1-141470	Views on remaining open issues on dual connectivity	NTT DOCOMO	
R1-141487	On physical layer support for dual connectivity	MediaTek Inc.	
R1-141506	Power scaling for dual connectivity	Broadcom Corporation	
R1-141507	Uplink power control for dual connectivity	Broadcom Corporation	
R1-141536	UL power control and power headroom reporting for dual connectivity	NSN, Nokia	

R1-141556	Power scaling in Dual Connectivity	InterDigital	
R1-141575	UL Power Control for Simultaneous UCI Transmission	ASUSTeK	
R1-141580	UL Power Control for Dual Connectivity	BlackBerry UK Limited	
R1-141604	UL Power Control Considerations for Dual Connectivity	Texas Instruments	
R1-141645	UL Power control in dual connectivity	Ericsson	
R1-141646	UE Capability in Dual Connectivity	Ericsson	
R1-141647	Power headroom reporting for dual connectivity	Ericsson	
R1-141648	Simultaneous Rx/Tx support for dual connectivity	Ericsson	

7.2.6 Inter-eNB CoMP for LTE

WID in RP-132103.
Mr Chair's recommendation: RAN agrees to reduce the scope of WI to what is indicated in RP-140523 starting from the line "Proposal: RAN agrees to reduce the scope of WI to the items listed below based on X2 interface"

R1-141873	Summary of Ad-hoc session on Inter-eNB CoMP for LTE	Ad-Hoc Chairman (Alcatel Lucent)	

The document was presented by Matthew Baker from ALU and provides the outcomes of Inter-eNB CoMP session.
Decision: The document is endorsed and incorporated below.

R1-141135	Issues in Inter-eNB CoMP with non-ideal backhaul	Huawei, HiSilicon	

Decision: The document is noted.

R1-141790	Signaling for Inter-eNB Operation of CoMP	Ericsson	(R1-141649)

Decision: The document is noted.

R1-141806	Further evaluation results for inter-eNB CoMP	Samsung	(R1-171297)

Decision: The document is noted.

R1-141296	Signalling for inter-eNB CS/CB operation	Samsung	

Decision: The document is noted.

R1-141618	Performance analysis of coordination based on RSRP	CMCC	

Decision: The document is noted.

R1-141725	Signalling details and procedures supporting eCoMP	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	(R1-141251)

Decision: The document is noted.

R1-141234	Signaling of PDSCH and PUSCH usage for "*CoMP Hypothesis"* and *"Enhanced RNTP"*	IAESI, DAC-UPC	

Decision: The document is noted.

R1-141445	Parameters for backhaul signaling	Qualcomm Inc.	

Decision: The document is noted.

R1-141471	Details on Backhaul Signaling for Inter-eNB CoMP	NTT DOCOMO	

Decision: The document is noted.

R1-141809	WF on Inter-eNB CoMP for LTE	Samsung, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, AT&T, CATR, China Telecom, China Unicom, CHTTL, CMCC, Deutsche Telekom, ETRI, KDDI, KT Corp., LG Electronics, LG Uplus, New Postcom, NEC, NTT DOCOMO, Potevio, Qualcomm, SK Telecom, Telecom Italia, ZTE	

Objections: Ericsson, Huawei
Technical concerns: NSN
Decision: The document is noted.

Working Assumption:
RAN1 has identified the following signalling for eCoMP and asks RAN3 to consider the feasibility of this signalling and to work on the details of in Rel-12.

- One or more *CoMP hypotheses, each* comprising a hypothetical resource allocation associated with a cell ID, where the cell identified by the cell ID is not necessarily controlled by the receiving eNB
  - How to react to a received *CoMP hypothesis* signalling is up to receiving eNB's implementation. E.g. accept or ignore, potentially sending a feedback e.g. "yes/no" to the sending node.
  - RAN1 guidance to RAN3 on necessary granularity and rate of CoMP hypothesis in time/frequency domain:
    - Signaling period: FFS until Thursday or Friday
    - RAN3 to specify the exact periodicities taking into account limitation of existing X2 interface
      - Per RB with time granularity per cell

        - Time granularity could be one or multiple subframe level
- A *benefit metric* associated with one or more *CoMP hypothesis/es*, quantifying the benefit that a cell of the sender node expects in its scheduling when the associated CoMP hypothesis/es is assumed
    - The range of benefit metric in the X2 message should be specified
    - The method of deriving the cell-specific benefit metric is up to each eNB implementation
    - RAN1 guidance to RAN3:
        - Necessary time/frequency granularity and signalling period: Same as the associated CoMP hypothesis/es
- RSRP measurement reports of one or more UEs
    - RAN1 guidance to RAN3:
        - Time domain granularity of the signaling: FFS until Thursday or Friday e.g. event triggered or periodic exchange, with possible periodicity to allow smallest configurable interval of RSRP reporting, namely 120ms.
            - Mechanism to provide RSRP report upon request from an eNB should be made available
        - Per cell in sending eNB identified by cell ID:
            - Per UE identified by C-RNTI:
                - One or more set(s) of {RSRP and cell ID} (maximum number of set(s) equals eight)
- Note: CoMP signalling needs to be associated with a carrier frequency identity.

Thursday
Agreement:
RAN1 has identified the following signalling for eCoMP and asks RAN3 to consider the feasibility of this signalling and to work on the details of in Rel-12.

- One or more *CoMP hypotheses, each* comprising a hypothetical resource allocation associated with a cell ID, where the cell identified by the cell ID is not necessarily controlled by the receiving eNB
    - How to react to a received *CoMP hypothesis* signalling is up to receiving eNB's implementation. E.g. accept or ignore, potentially sending a feedback e.g. "yes/no" to the sending node.
    - RAN1 guidance to RAN3 on necessary granularity and rate of CoMP hypothesis in time/frequency domain:
        - Signaling period: RAN1's recommendation is 5, 10, 20, 40, 80 ms or aperiodic
            - If aperiodic, a validity period for the information should be included
        - RAN3 to specify the exact periodicities taking into account limitation of existing X2 interface
        - Per RB with time granularity per cell
            - Time granularity could be one or multiple subframe level
- A *benefit metric* associated with one or more *CoMP hypothesis/es*, quantifying the benefit that a cell of the sender node expects in its scheduling when the associated CoMP hypothesis/es is assumed
    - The range of benefit metric in the X2 message should be specified
    - The method of deriving the cell-specific benefit metric is up to each eNB implementation
    - RAN1 guidance to RAN3:
        - Necessary time/frequency granularity and signalling period: Same as the associated CoMP hypothesis/es
- RSRP measurement reports of one or more UEs
    - RAN1 guidance to RAN3:
        - Time domain granularity of the signaling: event triggered or periodic exchange, with periodicities 120, 240, 480, 640 ms.
            - Mechanism to provide RSRP report upon request from an eNB should be made available
        - Per cell in sending eNB identified by cell ID:
            - Per UE identified by a UE ID, e.g. eNB-UE-X2-APID:
                - One or more set(s) of {RSRP and cell ID} (maximum number of set(s) equals eight)
- Note: CoMP signalling needs to be associated with a carrier frequency identity.

****
FFS until Thursday, aiming for consensus (proponents of CSI are encouraged to provide information on IMR planning and explanation on how it works:

- Optional signalling of ~~O~~one or more sets of CSI information (RI, ~~PMI,~~ CQI) of a set of UEs that can be supported taking into account limitations of existing X2 interface
    - RAN1 guidance to RAN3 on necessary rate of exchanging one or more sets of CSI reports over X2 interface:
        - Signaling period: FFS until Thursday or Friday e.g. 5ms for periodic exchange
            - RAN3 to specify the exact periodicity taking into account limitation of existing X2 interface
            - Mechanism to provide CSI reports upon request from an eNB should be made available.
        - Per CSI process per subband per UE per cell

In favour of including CSI: Samsung, LG, Docomo, ZTE, ALU, ASB, IAESI, NEC, DT, Telecom Italia, CMCC, Qualcomm

Opposed to including CSI: Ericsson (due to concerns over IMR overhead and planning), Huawei (due to concerns of huge performance loss in inter-vendor operation), HiSilicon
Thursday
In favour of including CSI: Samsung, LG, Docomo, ZTE, ALU, ASB, IAESI, NEC, DT, Telecom Italia, CMCC, Qualcomm, Orange, AT&T, Broadcom, CTC, KDDI, ETRI, New Postcom, Potevio, KT
Opposed to including CSI: Ericsson (due to concerns over IMR overhead and planning), Huawei (due to concerns of huge performance loss in inter-vendor operation), HiSilicon
Sustained objection: Ericsson, Huawei, HiSilicon
NSN has concerns due to believing benefit metric can serve the same purpose as CSI but will not object.

- *Enhanced RNTP* can be signaled between eNBs to facilitate CoMP
  - Information granularity of the *Enhanced RNTP* is extended to the frequency/time domain
    - RAN1 guidance to RAN3:
      - Signaling periodicity: Event triggered (the same as the current RNTP)
      - Exchanged with the corresponding subframe index with common understanding of the subframe index among cells
      - Pattern assumed to be repeated after specified periodicity
  - Information in the *Enhanced RNTP* is (optionally multi-level) transmit power threshold for only the sender eNB.
    - RAN1 guidance to RAN3 on necessary granularity of transmit power threshold and levels:
      - FFS until Friday or Thursday whether to use the same set of the current RNTP thresholds
  - Possible enhancement on existing *Status report*, which can be signaled between eNBs to exchange the usage status of the indicated frequency/time resources

Thursday
In favour of including E-RNTP: Hitachi, LGE, IAESI, Fujitsu, Ericsson, NSN, Nokia
Opposed to including E-RNTP: Samsung
Sustained objection: Samsung

Revisit on Thursday to:
- Close the FFS points
- Confirm Working Assumption
- Agree LS to RAN3

Prepare draft LS to RAN3 based on Working Assumptions so far: in R1-141810.

R1-141810	[draft] LS on Inter-eNB CoMP for LTE	Samsung	R1-141816

Decision: The document is noted and needs to be updated according to the agreement above; final version agreed in R1-141816.

Conclusion on UE-CSI:
No consensus in RAN1.
Samsung expresses concern on the small number of companies objecting.
Companies are of course free to bring company contributions to RAN plenary on this issue.

R1-141807	WF on CoMP-NIB signalling	NSN, Nokia, Ericsson, Hitachi	

Decision: The document is noted.

R1-141867	Further evaluation study and IMR configuration for inter-eNB CoMP	Samsung	

Decision: The document is noted.

7.2.7 LTE Device to Device Proximity Services

WID in RP-140518.

Mr Chair's recommendation: Focus on device to device discovery in network coverage (intra-cell and inter-cell) and communication in network coverage (intra-cell and inter-cell), in partial network coverage and outside network coverage. The communication part is targeted to apply only to public safety use. The partial network coverage and out of network coverage scenarios apply only to public safety use. The work will proceed from the starting point of the agreements and working assumptions reached during the study item as captured in TR 36.843.
No relaying, no standardized inter-cell coordination based on X2 or air interface, no out of network discovery in Release 12 and limited time to be spent on inter-frequency discovery.

R1-141874	Summary of Ad-hoc session on Study on LTE Device to Device Proximity Services	Ad-Hoc Chairman (Alcatel Lucent)	

The document was presented by Matthew Baker from ALU and provides the outcomes of D2D session.

Discussion: IAESI made a general comment that more realistic simulation assumptions (to increase the spectral efficiency of the spectrum…) should be considered.
Qualcomm expressed concerns about R1-141885, includes aspects that were not discussed. Ok with including aspects that were not discussed during the session as a starting point, but at least limited to what was shared in the earlier draft.
Ad Hoc Chair suggested including the endorsement of R1-141885 in the email discussion.
Ericsson suggested removing reference to R1-141885 and extract the non-controversal part as shown in 7.2.7.2.2
Decision: The document is endorsed and incorporated below.

7.2.7.1 D2D physical signals and channels

For both D2D discovery and broadcast communication

7.2.7.1.1 D2D physical channel design discovery and broadcast communication based on PUSCH structure

R1-141387	Frame Structure for D2D-Enabled LTE Carriers	Ericsson	

Decision: The document is noted.

R1-141423	D2D physical channel design for broadcast communication based on PUSCH structure	ZTE	

Decision: The document is noted.

R1-141557	On physical channel design for D2D broadcast communication and discovery	InterDigital	

Decision: The document is noted.

R1-141447	Link level simulation results for D2D broadcast communication	Qualcomm Inc.	

Decision: The document is noted.

Discuss offline until Thurday: -107 dBm is the design target for D2D VoIP communication.
Thursday 3rd
Agreement: As good or better than -107 dBm is the design target for D2D VoIP communication.

This does not preclude evaluations with other association thresholds.

Communication

R1-141384	D2D Physical Channels Design	Ericsson	

Decision: The document (Section 4) is noted.

R1-141192	Physical channel design for D2D communication	CATT	

Decision: The document is noted.

Scrambling

R1-141191	Channel scrambling and DMRS design for D2D communication	CATT	

Decision: The document is noted.

R1-141298	D2D broadcast communication physical channel design details	Samsung	

Decision: The document is noted.

R1-141382	On Scrambling of D2D Physical Channels	Ericsson	

Decision: The document is noted.

Agreements:
- D2D data communication channel transmissions are scrambled by the ID in the SA
- Scrambling seed of the SA is fixed in the specifications

R1-141137	Scrambling for D2D Broadcast Communication	Huawei, HiSilicon	

Decision: The document is noted.

Gap

R1-141301	Discussion on guard perion in D2D PUSCH	Samsung	

Decision: The document is noted.

R1-141136	On the gap definition	Huawei, HiSilicon	

Decision: The document is noted.

R1-141207	Timing analysis for D2D transmission gap requirement	NEC	

Decision: The document is noted.

R1-141849	WF on D2D Signal Gap	Qualcomm Incorporated, General Dynamics, CATT, Fujistu	

Decision: The document is noted.

Agreement:
- At least for UEs which are not out-of-coverage, the size of the gap agreed in RAN1#76 for both communication and discovery is 1 symbol at the end of every D2D transmission which does not use uplink timing advance
  - FFS ~~(revisit on Thur)~~ whether a "D2D transmission" can in some cases be considered to have a duration of more than one subframe, and if so, in which cases.
- Gap is created by puncturing.
- There is no explicit signalling of the presence/absence of the gap

Thursday 3rd
W.r.t above FFS, Hanbyul (LGE) to prepare a list of all relevant cases to identify which ones need a gap and which do not – for email discussion until RAN1#77.

Discovery

R1-141479	Discovery Preamble Design for AGC Consideration in SC-FDM systems	ITRI	

Decision: The document is noted.

R1-141727	Signal Design for D2D Discovery and Broadcast	Qualcomm Inc.	(R1-141446)

Decision: The document is noted.

R1-141254	Preamble design for D2D Discovery	Aclatel-Lucent Shanghai Bell, Alcatel-Lucent	

Decision: The document is noted.

R1-141539	Issues in D2D Discovery Signal Design	Nokia, NSN	

Decision: The document is noted.

R1-141159	On D2D Discovery Preamble and Reference Signals	Intel Corporation	

Decision: The document is noted.

R1-141847	WF on Discovery Preamble for Asynchronous Deployments	Qualcomm Incorporated, General Dynamics, Fujistu, ZTE	

Decision: The document is noted.

Proposal:
- UEs can be configured to forward timing of their associated cell using PD2DSS signaling
- For a cell, within a discovery period, the first sub-frame with discovery resources be used for transmitting the PD2DSS
- UEs associated with the same cell forward timing in a SFN manner
  - FFS whether and which subset of UEs forward timing
- The frequency resource and symbols used for transmission of PD2DSS are RRC configured.

Continue discussion on Thur
Thursday 3rd
- Ericsson - SIB of serving cell can provide information about timing of other cells

Continue discussion at RAN1#77.

R1-141848	WF on D2D PUSCH Structure	Qualcomm Incorporated, ZTE, General Dynamics, CATT	

Decision: The document is noted.

Agreement:
- For discovery only
  - At least if message is not smaller than 104 bits, CRC is 24 bits
  - Message scrambling is independent of any ID of the transmitting UE

Continue discussion on Thur:
- For Discovery and data communication
  - No modification to (PUSCH) interleaver and RE mapping
- For discovery only
  - DMRS cyclic shift is chosen randomly every transmission

Thursday 3rd

Agreement:
- For Discovery and data communication and SA
  - No modification to (PUSCH) interleaver

Continue discussion at RAN1#77on:
- the PUSCH RE mapping
- For discovery only, whether DMRS cyclic shift is chosen randomly every transmission

R1-141811	WF on D2D Discovery Preamble	ITRI, ALU, ASB, LG Electronics, III, Nokia, NSN, Broadcom, Fujitsu	

Decision: The document is noted.

Proposal is supported by: LG, ITRI, ETRI, Fujitsu, Broadcom, ALU, ASB, Sony, Nokia, NSN
Not supported by: Qualcomm, GDBUK, InterDigital, Ericsson, Intel, Huawei, HiSilicon
- D2D Preamble is supported ~~at least for AGC setting in both D2D Discovery and Communication~~
  - D2D preamble is always transmitted at the start of each D2D transmission, where here a "D2D transmission" comprises any consecutive D2D communication/discovery transmissions in the same PRBs from the same UE over one or more subframes
    - FFS whether D2D preamble is also transmitted at the start of all other D2D subframes
  - ~~If D2D preamble exists, t~~The preamble is placed ~~from~~ starting in the first symbol of the first D2D subframe
  - Number of symbols is FFS
  - Waveform is distinct from the data transmission, details FFS
  - Preamble signal is FFS.
- FFS whether D2DSS itself can provide the necessary functionality without a specific preamble for the D2DSS
  - If a specific preamble is needed for D2DSS, FFS whether the waveform is the same for D2DSS as for discovery/communication

Suggested motivations of preamble:
- AGC setting in both D2D Discovery and Communication.
- Timing acquisition

Conclusion: Discuss further whether the first symbol data is sufficient for AGC or whether a different preamble is needed – email discussion until RAN1#77 (Yan-Xiu, ITRI)

CP Length

R1-141300	Discussion on CP length for D2D PUSCH	Samsung	

Decision: The document is noted.

R1-141591	Co-existence of Normal CP OFDM symbol and Extended CP OFDM symbol in D2D communication/discovery	Huawei, HiSilicon	

Decision: The document is noted.

R1-141753	WF on D2D CP length configuration	Huawei, HiSilicon, Ericsson, Fujitsu, General Dynamics, LGE, Potevio, Qualcomm, Blackberry, Samsung	

Decision: The document is noted. Also supported by IDC.

Agreement:
- If the transmitting UE is in-coverage, the CP lengths for D2D signals and cellular traffic are independently configured
  - D2D CP length is set by common higher layer signaling
  - FFS whether the SA, D2D data and D2DSS may use different CP lengths
- FFS which CP length to use /how to configure it if the transmitting UE is not in-coverage
- The impact on cellular traffic of using a different CP length for D2D should be minimised.

Not treated.

R1-141160	Remaining details of D2D physical structure design	Intel Corporation	
R1-141161	On D2D Discovery Resource Size	Intel Corporation	
R1-141190	Details of discovery signal design	CATT	
R1-141228	On D2D discovery signal design details	Fujitsu	
R1-141252	D2D Channel Design for broadcast communication	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-141253	D2D discovery channel design	Aclatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-141347	Discussion on D2D communication physical layer design	LG Electronics	
R1-141422	Design details of discovery signal and channel	ZTE	
R1-141497	On the signal design and resource allocation of reply signal for D2D discovery	III	
R1-141651	ProSe device-to-device discovery link performance	General Dynamics	
R1-141738	Discussion on D2D discovery physical layer design	LG Electronics	(R1-141348)
R1-141851	Physical channel design for scheduling assignment	Samsung	(R1-141299)

7.2.7.1.2 Control needed for broadcast communication transmission/reception

R1-141802	WF on Content of Scheduling Assignment	Qualcomm Incorporated, III, CATT, General Dynamics	

The document was presented by Shailesh Patil from Qualcomm.

- Scheduling assignments contains
  - MCS of Data
  - TX UE ID and/or Target ID
    - Not precluding scrambling SA CRC by TX UE ID or Target ID
  - FFS: Timing advance for Data
  - Following resource allocation information
    - Initial and retransmissions of a MAC PDU
    - Transmission of multiple MAC PDUs

Discussion: Huawei → not relevant to this agenda item
Decision: The document is noted. Continue offline discussion.

Wednesday 2nd

R1-141193	Control for D2D communication	CATT	

Decision: The document is noted.

R1-141255	D2D control signaling	Aclatel-Lucent Shanghai Bell, Alcatel-Lucent	

Decision: The document is noted.

R1-141302	Control information for D2D broadcast communication	Samsung	

Decision: The document is noted.

R1-141391	On Scheduling Assignments and Receiver Behaviour	Ericsson	

Decision: The document is noted. Note typo in Proposal 4: "D2D data" -> "SA"

R1-141448	Control for D2D broadcast communication	Qualcomm Inc.	

Decision: The document is noted.

R1-141592	Control information for D2D communication	Huawei, HiSilicon	

Decision: The document is noted.

R1-141558	On control signaling for D2D broadcast communication	InterDigital	

Decision: The document is noted.

Agreement:

- Apart from data channel (and associated DMRS) and scheduling assignment (and possible PD2DSCH), no separate L1 D2D control channel is defined.

Agreement:
For transmissions on the data channel, no new mappings between MCS and TBS are defined outside those existing in Rel-8

Alt1: Broadcom, Samsung, ITRI, ETRI,

- No dynamic MCS indication is provided
- The existing 5-bit MCS table is used for configuration (or preconfiguration for out-of-coverage) of the MCS
  - FFS: Details of how the configuration is done, e.g. semi-static or linked to a target ID
  - FFS whether a default value is specified

- For a given configuration, there is a 1-to-1 mapping between resource allocation size and TBS

Alt2: Sharp, QC, ZTE, IDC, CATT, NEC, Pana, GDB, Kyocera, Fujitsu, Coolpad, ALU, ASB
- Dynamic MCS indication is provided with 1 or 2 bits, downselected from the existing 5-bit MCS table

Alt 3: Sharp, QC, ZTE, IDC, Pana, GDB, HW, HiSi, Kyocera, Coolpad, Ericsson, LGE, ALU, ASB, Nokia, NSN
- Dynamic MCS indication is provided with 5 bits, using the existing 5-bit MCS table

Agreement:
- MCS indication is provided dynamically per SA with 5 bits, using the existing 5-bit UL MCS table
- 64QAM shall not be used for D2D transmission
- The MCS indication is included in SA
- The MCS for SA is fixed in the specifications
- The modulation used for SA is QPSK

Agreement
- The SA includes an ID of N bits (N<=16, working assumption N=8) with at least the following purpose:
  - to enable the UE to reduce the probability of decoding of data packets the UE is not interested in
- FFS what the ID is derived from
- Not precluding scrambling SA CRC

Send an LS to RAN2 to inform them that RAN1 is considering including an ID of 8 bits in the SA to enable the UE to reduce the probability of decoding of data packets the UE is not interested in, and RAN1 is considering using an ID to reduce collisions between data transmission parameters (e.g. scrambling). Ask them to provide their advice on these IDs and on the value of N – Saurabha - R1-141812 – revisit on Thur

For RAN1#77:
- Consider how to signal the RPT in the SA (considering both Mode 1 and Mode 2)
- Consider detailed design of the SA transmission
- Consider whether NDI and/or RV are needed and if so how to signal them

Thursday 3rd

R1-141812	Draft LS on identifier in scheduling assignment for D2D communication	Qualcomm	

Decision: The document is noted and final LS is agreed in R1-141813.

Not treated.

R1-141217	Control signalling/channel design in D2D communication	Panasonic	
R1-141229	Futher analysis on control signal and SA for D2D communication	Fujitsu	
R1-141264	D2D Transport Block Retransmission	ETRI	
R1-141349	Control design for D2D broadcast communication	LG Electronics	
R1-141392	Timing Aspects in D2D Discovery and Communication	Ericsson	
R1-141424	Control signalling for D2D broadcast communication	ZTE	
R1-141459	Design details of scheduling assignments	Kyocera	
R1-141545	Discussion on D2D Control Channel	Intel Corporation	
R1-141601	On control information of D2D communication	CATR	
R1-141685	On Scheduling Assignment Message Design	CEWiT	

7.2.7.1.3 Other

Not treated.

R1-141383	Discussion on the Association Threshold for D2D Communication	Ericsson, Qualcomm, US Department of Commerce	
R1-141398	Discussion on D2D transmission timing in network coverage	KDDI	

7.2.7.2 D2D resource allocation mechanisms

Mr Chair's recommendation: For both D2D discovery and broadcast communication

R1-141231	Discussions on D2D resource allocation	Fujitsu	

The document was presented by … from Fujitsu and draws the following proposals:

- Proposal 1: Mode 2 can operate in-coverage, edge-of-coverage and out-of-coverage.
- Proposal 2: The only resource pool for D2D data is TX resource pool for Mode 2. There is no need to define a D2D TX data resource pool for Mode 1, nor D2D data RX resource pool.
- Proposal 3: Different D2D data only TX resource pools can be configured for Mode 1 and Mode 2 UEs.
- Proposal 4: Resource pool design should take into consideration of in-band-emission, time/frequency diversity and half-duplex limitation.
- Proposal 5: TDM+FDM structure should be employed for resource pool and resource unit design.
- Proposal 6: Resource pool design should avoid occupying contiguous resource in the frequency domain.
- Proposal 7: Same CP length should be employed by D2D UEs transmitting on resources from the same resource pool.

Decision: The document is noted.

R1-141388	Discovery Resource Allocation	Ericsson	

The document was presented by Stefano Sorrentino from Ericsson and proposes:

- Proposal: Type 1 UEs transmit exactly one discovery message per discovery period. Some Type 2 UEs may perform retransmissions within the discovery period, according to the received configuration.
- Proposal: For Type 1 discovery each UE selects a single discovery resource randomly in time and frequency for each discovery period. Type 1 discovery is supported in-coverage. FFS whether Type 1 discovery is supported in edge-of-coverage.
- Proposal: For Type 2 discovery each UE is assigned a time/frequency resource pattern by the eNB.
    - The eNB configures the number of (re)transmissions
    - The resource pattern is PUCCH-like in the frequency domain to avoid resource fragmentation
    - Type 2 discovery is supported in-coverage. FFS whether Type 2 discovery is supported in edge-of-coverage and by RRC_Idle UEs.
- Proposal: For Type 2 the UE-specific resources are provided by RRC or other signaling under discussion in RAN2.
- Proposal: During each discovery period, L1 reports to higher layers the set of discovered messages and an energy measurement per each message. Multiple detections of the same discovery message within the same discovery period are reported only once to higher layers
- Proposal: Descrambling of discovery messages is based on the cell PCID
- Proposal: The discovery message format (PS, commercial) is indicated by the DMRS cyclic shift.

Decision: The document is noted.

R1-141571	D2D Resource Pool and Scheduling Assignments	Sony	

The document was presented by Matthew Webb from Sony and proposes:

- Proposal 1: Scheduling assignment resources implicitly define the position of corresponding data payload resources.
    - Proposal 1a: Scheduling assignment resource pools are separate from data resource pools.
    - Proposal 1b: There is a 1:1 mapping of scheduling assignment resources to data resources.
- Proposal 2: In Rel-12 the D2D *reception* resource pool should be static and predefined (i.e. fixed in the specification) and should be common for in-coverage, out-of-coverage, and partial-coverage scenarios.
    - Proposal 2a: Out-of-coverage resource pool must be a subset of the reception resource pool.
    - Proposal 2b: The eNB may semi-statically allocate an out-of-coverage resource pool which includes resources which are part of the pre-defined resource pool, but cannot include resources which are not in the pre-defined resource pool (i.e. eNB can restrict the resources used for out of coverage)
    - Proposal 2c: UEs which are operating mode 2 while in-coverage use the out-of-coverage resource pool.
    - Proposal 2d: Out-of-coverage resource pool is divided into 2 subsets and the UE selects one of these subsets depending on where it's synchronisation source originates (eNB or UE).
    - Proposal 2e: In-coverage mode 1 resources must be individually allocated to a UE from the remaining reception resources.
- Proposal 3: D2D reception resource pool should be in a fixed number of contiguous RBs within the uplink bandwidth.
    - Proposal 3a: D2D transmission resource pools should be a subset of the fixed number of contiguous RBs defined for the transmission resource pool.

Decision: The document is noted.

R1-141746	WF on D2D and Cellular Coexistence	Ericsson, Orange, Telecom Italia, Huawei	

Will be discussed after resource allocation discussion
Same with R1-141750 - Hyukjin Chae

Not treated.

R1-141230	RRM for D2D communication	Fujitsu	
R1-141390	On resource allocation for D2D communication	Ericsson	

R1-141540	Control of ProSe resource use	Nokia, NSN	

7.2.7.2.1 Distributed resource allocation

Communication

R1-141218	Resource allocation procedure for Mode 2 UE in D2D communication	Panasonic	

Decision: The document is noted.

R1-141593	Consideration on Mode 2 resource allocation	Huawei, HiSilicon	

Decision: The document is noted.

R1-141450	Distributed resource allocation for D2D broadcast communication	Qualcomm Inc.	

Decision: The document is noted.

R1-141194	Resource allocation mechanism in mode 2	CATT	

Decision: The document is noted.

R1-141256	Distributed resource allocation for D2D communication	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

Decision: The document is noted.

R1-141306	Mode 2 resource allocation for D2D broadcast communication	Samsung	

Decision: The document is noted.

R1-141819	WF on Distributed (Mode 2) resource allocation for communication	Qualcomm Incorporated, Kyocera, General Dynamics	

Decision: The document is noted.

Proposal:
- Random resource selection is baseline for distributed (Mode 2) communication
  - Randomization for D2D data is done at least based on the ID in the SA

Conclusion: Consider further the method of resource selection for Mode 2 until RAN1#77.

Not treated.

R1-141138	Resource allocation for type-1 and type-2B discovery	Huawei, HiSilicon	
R1-141162	On Type 1 D2D Discovery Resource Allocation	Intel Corporation	
R1-141195	Resource allocation for type 1 D2D discovery	CATT	
R1-141208	On resource selection for Type 1 discovery message transmission	NEC	
R1-141235	Self-organizing D2D communication using knowledge enforcement	IAESI	
R1-141303	Resource pool configuration for type-1 discovery	Samsung	
R1-141304	Resource allocation for type-1 discovery and WAN impact	Samsung	
R1-141350	Operation in Mode 2 resource allocation for D2D communication	LG Electronics	
R1-141351	Operation in Type 1 resource allocation for D2D discovery	LG Electronics	
R1-141425	Distributed resource allocation for D2D communication	ZTE	
R1-141460	Resource allocation for Type 1 discovery	Kyocera	
R1-141472	Discussion on resource selection for type 1 discovery	NTT DOCOMO	
R1-141510	Resource Allocation for Type 1 D2D Discovery	Fujitsu	
R1-141546	Discussion on D2D Operation Outside of Network Coverage (Mode-2)	Intel Corporation	
R1-141576	D2D communication resource scheduling	ASUSTeK	
R1-141577	Resource allocation/utilization for type-1 discovery	ASUSTeK	
R1-141729	Evaluation on D2D distributed resource allocation for discovery	CATR	(R1-141600)
R1-141735	Resource allocation for D2D discovery	Qualcomm Inc.	(R1-141449)
R1-141747	Collision avoidance mechanism for D2D broadcast communication	Samsung	(R1-141305)

7.2.7.2.2 eNB resource allocation

D2D communication

R1-141219	Resource allocation procedure for Mode1 UE in D2D communication	Panasonic	

The document was presented by Hidetoshi Suzuki from Panasonic and defines a resource allocation procedure for UE operated with Mode 1.

Decision: The document is noted.

R1-141451	eNB resource allocation for D2D broadcast communication	Qualcomm Inc.	

The document was presented by Saurabha Tavildar from Qualcomm and concludes as follows:

- Observation 1: No signalling for resource allocation is needed for Type 1 (*UE autonomous resource selection*).
- Proposal 1: Type 2 (*eNB Scheduled*) scheduling reuses existing PDCCH and DCI format 0 for D2D grants from eNB.
- Proposal 2: a D2D RNTI distinguishes DCI for D2D from DCI for WAN UL or DL.
- Proposal 3: 0/1A distinction flag in DCI format 0 is re-interpreted for SA/Data distinction
- Proposal 4: UE sends D2D Start indication to eNB in an RRC message including the Target ID(s) (Group ID) and corresponding indices (Target ID index).
- Proposal 5: In response to the D2D start indication from UE, eNB provides D2D RNTI and other configuration related to D2D communication to this UE in RRC signaling.
- Proposal 6: SA resource pool is signaled through SIB (in or edge-of-coverage) or is pre-configured (out-of-coverage).
- Proposal 7: RB assignment field of DCI format 0 is used for indexing into SA-resource pool.
- Proposal 8: eNodeB can send a D2D-SA grant at any time (>= 4 ms.) before SA resource pool occurrence.
- Proposal 9: Target ID index of 2 bits is included in SA grants to allow for UE to participate in multiple communication sessions (e.g. multiple group communication sessions).
- Proposal 10: the number and pattern of retransmissions of a given packet are signaled through RRC and a D2D-data grant accordingly signals the resources for retransmissions of a packet.
- Proposal 11: SPS scheduling of both SA and data is supported.
- Proposal 12: SPS scheduling for D2D uses existing mechanisms of (i) configuration through RRC signalling and (ii) activation/release through DCI using a SPS-D2D-RNTI.
- Proposal 13: the number and pattern of retransmissions of a given packet signaled through RRC also apply to SPS scheduling of data transmission.

Decision: The document is noted.

R1-141307	Mode 1 resource allocation for D2D broadcast communication	Samsung	

The document was presented by Thomas Novlan from Samsung and concludes as follows:

- Observation 1: The existing cellular resource request and resource assignment procedure should be taken as the baseline for Mode 1 resource allocation as much as possible.
- Proposal 1: The existing scheduling request procedure can be baseline for Mode-1 resource allocation.
- Proposal 2: The contents of the BSR should distinguish between D2D and cellular resource allocation requests.
- Proposal 3: The following alternatives for resource allocation signaling for Mode-1 should be further evaluated considering the tradeoffs between specification impact, total overhead, and resource allocation flexibility:
  - Alt. 1: Use an existing DCI format for UL allocation and introduce a new C-RNTI for D2D resource allocation
  - Alt. 2: Use an existing DCI format for UL allocation and use the timing relationship between the DCI reception and resource configuration to differentiate between D2D and cellular resource allocations
  - Alt. 3: Modify an existing UL allocation DCI format for D2D resource allocation
  - Alt. 4: Introduce a new DCI format for D2D allocation
- Proposal 4: A single resource allocation grant can be provided by the eNB for D2D data and SAs transmission.
- Proposal 5: A SA is indicated by the DMRS of the corresponding D2D data transport block and is concurrently transmitted within the same D2D resource.

Decision: The document is noted.

R1-141427	Scheduling-based D2D communication resource allocation	ZTE	

The document was presented by Yifei Yuan from ZTE and proposes:

- Proposal 1: Control channel resource pool should be independent from data channel resource pool for Mode 1.
- Proposal 2: For Mode 1, control channel resource pool should be assigned by eNB/RN at least.
- Proposal 3: In order to achieve a simplified eNB/RN resource scheduling and a possible uniform operation with Mode 2, a pre-defined channel pattern with control channel and data channel is preferred.
- Proposal 4: Mode 1 should also be supported for edge-of-coverage scenario.

Decision: The document is noted.

R1-141352	Operation in Mode 1 resource allocation for D2D communication	LG Electronics	

The document was presented by Younsum Kim from LGE and proposes:
- Proposal 1: The eNB semi-statically allocates the D2D resource to a transmitter UE, e.g. via RRC signal and controls the D2D transmissions (e.g., resource allocation, power control, etc) in a dynamic manner by (E)PDCCH.
- Proposal 2: It is necessary for eNB to get acknowledged about whether D2D UE receives activation or deactivation message successfully and resultantly semi-static D2D resource is activated or released.
- Proposal 3: Relevant reports such as BSR, RSRP/RSRQ, BLER and resource utilization from UE are beneficial for eNB to determine a proper D2D communication set for each UE as well as overall resource and interference management.

Decision: The document is noted.

R1-141754	WF on eNB (Mode 1) resource allocation for communication	Qualcomm Incorporated, LG, ZTE, III, General Dynamics	

The document was presented by Saurabha Tavildar from Qualcomm.
- eNodeB or Rel-10 relay allocates resources to a D2D transmitter for SA and Data using PDCCH or EPDCCH
- Instead of C-RNTI, a D2D-RNTI is used for a D2D grant
- eNodeB or Rel-10 relay controls transmission power of SA and Data using PDCCH or EPDCCH

Discussion: Panasonic→ Instead of C-RNTI, a D2D-RNTI is used for ~~a~~ scrambling of CRC of D2D grant
Decision: The document is noted, modified and agreed as follows:

Agreements for Mode 1 transmission,
- eNodeB or Rel-10 relay allocates resources to a D2D transmitter for SA and Data using PDCCH or EPDCCH
  - FFS: Linkage between SA and Data
  - FFS: Separate grant for Data
  - Single grant can schedule multiple Data transmission opportunities
    - The multiple opportunities can be used for the multiple transmissions of a single TB
    - The multiple opportunities can be used for the transmissions of multiple TBs
    - FFS: Which entity decides how each transmission opportunity is used
  - FFS: Single grant can schedule single SA transmission
  - Single grant can schedule multiple SA transmissions
    - FFS: Whether the multiple SA transmissions are of the same SA or different SA
- FFS: C-RNTI or another UE-specific RNTI is used at least for scrambling of CRC of a D2D grant
- eNodeB or Rel-10 relay controls transmission power of SA and Data using PDCCH or EPDCCH

R1-141750 : proponent requested more time – WF not ready

D2D discovery

R1-141473	Discussion on resource allocation for Type 2B discovery	NTT DOCOMO	

The document was presented by Zhao Qun from NTT DoCoMo and proposes:
- Proposal 1: A resource pool is semi-statically assigned for type 2B discovery receiving UEs
  - The size of the region should be adjustable according to the number of type 2B discovery UEs.
  - The resource region can be FDM/TDM with resources allocated for type 1 discovery.
- Proposal 2: A predetermined hopping pattern should be applied to type 2B discovery such that all the type 2B discovery UEs can discover each other within a minimum length of time while achieving a frequency diversity gain.
- Proposal 3: The transmission timing of type 2B discovery UEs is configurable by the eNB, e.g., together with eNB resource allocation or via SIB and by considering the real implementation of multiplexing between D2D resources and WAN resources.
- Proposal 4: Interference from D2D signals to WAN UL transmission should be investigated and mitigated by considering option 1, power control of D2D transmission, and option 2, allocating D2D resources at least K PRBs (in frequency domain) away from WAN resources (value of K is FFS).

Decision: The document is noted.

R1-141140	On the need to support type-2A discovery	Huawei, HiSilicon	

The document was presented by Philippe Sartori from Huawei and concludes as follows:
- Type-1 discovery is slow. Discovery delay can be improved, but results in high overhead and high power consumption
- When in RRC_Connected mode, the additional power consumption of type-2A is negligible and the discovery delay is very small (lower than 10 ms)
- The power consumption of type-2A discovery is 102 units when in RRC_Idle. The maximum discovery delay is dominated by the paging cycle
- Type-2A discovery is more efficient when the number of UEs participating in the discovery process is relatively small

The following proposals are made:
- Both type-1 and type-2A are supported since they are complementary
- Aperiodic discovery is supported

Decision: The document is noted.

R1-141749	On Type 2 D2D Discovery Resource Allocation	Intel Corporation	(R1-141165)

The document was presented by Debdeep Chatterjee from Intel and proposes:
- Proposal 1: Resource pools for Type 1 and Type 2B discovery should be multiplexed using TDM.
- Proposal 2: Following RAN2 baseline agreement that RRC_IDLE UEs may not transmit on Type 2B discovery resources, the T2 value for transmission on Type 2B resources is given by: T2 = TA for FDD, and T2 = 624Ts + TA for TDD.
- Proposal 3: RAN1 to further study towards specifying transmit power control mechanisms for Type 2B discovery that can facilitate efficient frequency division multiplexing of Type 2B discovery and UL WAN resources.
- Proposal 4: Decision on multiplexing of Type 2B discovery and UL WAN resources at the system level should be left to eNB implementation.
- Proposal 5: RAN1 to study and specify appropriate resource-mapping and hopping mechanism for Type 2B discovery to realize benefits from frequency diversity and alleviate the impact from half-duplex constraint at D2D UEs.

Decision: The document is noted.

R1-141744	WF on Type 2B discovery resource allocation	NTT DOCOMO, Ericsson, ZTE, Samsung, Intel, CATT, ITRI	

The document was presented by Zhao Qun from NTT DoCoMo.
- Confirm that a radio resource pool can be provided by eNB in SIB for discovery reception for type 2B
  - FFS whether a single reception pool or different reception pools for type 1 and type 2B discovery
- For Type-2B discovery, a resource hopping mechanism within the reception resource pool following the initial resource allocation by eNB can be applied
  - FFS details of resource hopping mechanism

Decision: The document is noted and modified as follows:

Potential agreements:
- Confirm that a radio resource pool can be provided by eNB in SIB for discovery reception for type 2B
  - FFS whether a single reception pool or different reception pools for type 1 and type 2B discovery
- For Type-2B discovery, a resource hopping mechanism within the reception resource pool following the initial resource allocation by eNB can be applied
  - FFS details of resource hopping mechanism

ALU: Necessity of hopping is not clear. Hopping is complicated.
LGE: How to address inter-cell discovery case? Is it one cell? ➔ Both can be considered
Continue offline discussion until Tuesday – Zhao (NTT DOCOMO)

Tuesday 1st

R1-141791	WF on Type 2B discovery resource allocation	NTT DOCOMO, Ericsson, ZTE, Samsung, Intel, CATT, ITRI	(R1-141744)

The document was presented by Zhao Qun from NTT DoCoMo.
- Confirm that a radio resource pool may be provided by eNB in SIB for discovery reception for type 2B
  - FFS whether the same reception pool or different reception pools for type 1 and type 2B discovery
- Mechanisms for Type-2B discovery
  - a resource hopping mechanism within the reception resource pool following the initial resource allocation by eNB can be applied
    - FFS details of resource hopping mechanism
  - Others FFS

Decision: The document is noted, modified and agreed as follows:

Agreements:
- Confirm that a radio resource pool(s) may be provided by eNB for D2D UEs in SIB for discovery reception for Type-2B (if supported)
  - FFS whether the common reception pool(s) or different reception pools for type 1 and Type-2B discovery
  - UE is not required to decode neighboring cell SIB
- Mechanisms for Type-2B discovery
  - a resource hopping mechanism following the resource allocation by eNB can be applied
    - FFS details of resource hopping mechanism
  - Others FFS

****

Tuesday session

R1-141795	WF on Time Randomization for D2D Transmissions	Qualcomm Incorporated, CATT, Ericsson, ALU, ASB, InterDigital	

The document was presented by Saurabha Tavildar from Qualcomm.

- One or more time retransmission patterns (TRP) are defined for multiple transmissions of data TBs
  - Different TRPs indicate different sets of time resources for multiple transmissions
- TRP is either implicitly or explicitly signaled by the eNB or Rel-10 Relay for Mode1
- TRP is either implicitly or explicitly signaled in SA
- If multiple transmissions of the same SA are supported
  - FFS whether one or more TRP are defined for (re)-transmissions of SAs

Decision: The document is noted, modified and agreed as follows:

Agreements:

- One or more resource patterns for transmission (RPT) of time and/or frequency resources for multiple transmission opportunities of data TBs can be defined
- RPT is either implicitly or explicitly signaled by the eNB or Rel-10 Relay for Mode1
- RPT is either implicitly or explicitly signaled in SA
- If multiple transmission opportunities of the same SA are supported
  - FFS whether one or more RPT are defined for (re)-transmissions of SAs

R1-141787	WF on SA Resource Allocation	Qualcomm Incorporated, Kyocera, III, General Dynamics, ZTE	

The document was presented by Shailesh Patil from Qualcomm.

- Semi-static pool of resources can be allocated for SA
- SA resource pool is divided into equal sized resources unit
  - Each SA resource unit FFS between 1RB or 2RB pair
- In-coverage eNodeB broadcasts the information about the resource pool is signaled using SIB
- For Mode 2: SA resource pool is separate from data resource pool.

Discussion: Several companies (Huawei, Samsung,…) claimed too early to agree it
Decision: The document is noted. Continue offline discussion and revisit later on.

Agreements:

- Semi-static pool(s) of resources can be allocated for SA
- eNodeB may broadcast the information about the SA resource pool using SIB for D2D UE
  - Transmission pool for Mode 2
  - Reception pool(s) for Mode 1 and Mode 2
- UE is not required to decode neighboring cell SIB

R1-141746	WF on D2D and Cellular Coexistence	Ericsson, Orange, Telecom Italia, Huawei	

The document was presented by Stefano Sorrentino from Ericsson.

- Mode-1 is specified and supported by all UEs with D2D PS communication capabilities
- The following work plan is proposed for RAN1:
  - Companies should provide preliminary results on cellular impact by D2D in RAN1#77
    - Discovery and communication should be evaluated separately
    - Simulations assumptions according to TR 36.843
      - Focus on VoIP traffic model for D2D PS communication
    - In addition to metrics related to D2D performance (as in TR 36.843, section 10), at least the following metrics related to impact on cellular should be provided :
      - Amount of resources not available for cellular communication
      - Cdf of user-throughput for cellular communication, with and without D2D
  - If non-negligible impact on cellular performance is observed, discuss solutions and specify them in case of standard impact

Discussion: ALU commented that results have already been provided in recent meeting showing main impacts on PUCCH.
Ericsson: still there was no conlucion drawn in TR
Decision: The document is noted.
Mr Chair then allocated an ad-hoc session and invited companies to come back with some results – Ericsson.

- Companies are invited to discuss remaining simulation parameters that need to be harmonized to provide meaningful results.

Tuesday evening

R1-141837	Summary of D2D ad-hoc session	Ericsson	

The document was presented by Stefano Sorrentino from Ericsson.

Decision: The document is noted.

Proposed way forward:
- Agree on simulation baseline and PUCCH performance metric.
- If the above agreement is possible by end of the week, the above WF(R1-141746) is agreed.
- If the above agreement changes parts of the WF, the 2nd bullet of the WF has to be updated accordingly.

Objections:
- Qualcomm and USDoC object on the 1st main bullet if it says only "mode-1"
- Intel objects on the 1st main bullet if it says "mode-1 and mode-2"
- Intel, USDoC and Qualcomm are invited to discuss offline and find agreement.

- Qualcomm agrees on the 2nd main bullet only if DL throughput CDF is added as a metric instead of the PUCCH performance metric

Agreements:
- Mode-1 is specified for PS
- Mode-2 is specified for PS
- Which mode(s) UE supports will be discussed separately in Rel-12 UE capability discussion

Agreed by Intel for the sake of progress

Possible agreements:
- The following work plan is proposed for RAN1:
  - Companies should provide preliminary results on cellular impact by D2D in RAN1#77
    - Discovery and communication should be evaluated separately
    - Simulations assumptions according to TR 36.843
      - Focus on VoIP traffic model for D2D PS communication
    - In addition to metrics related to D2D performance (as in TR 36.843, section 10), at least the following metrics related to impact on cellular should be provided :
      - Cdf of UL user-throughput for cellular communication, with and without D2D, with and without the potential solutions
      - [PUCCH performance metric or DL throughput CDF], with and without D2D, with and without the potential solutions
  - Discuss solutions and specify them in case of standard impact
    - Potential solutions are, e.g., Power Control mechanism/protocol, CP lengths for FDM of D2D/cellular, resource restriction.
- Companies are invited to discuss remaining simulation parameters that need to be harmonized to provide meaningful results.

Continue offline discussion by utilizing Wednesday morning coffee break – (Ericsson)
Outcome of offline discussion is in R1-141885.

Friday 4th

R1-141885	Summary of D2D ad-hoc session	Ericsson	(R1-141853)

Decision: The document is noted. Email discussion of following starting point until 10th April (Qualcomm)

Possible starting point of email discussion:

The agreed simulation parameters are not intended to influence any of the FFS for the system design.

Simulation baseline (where different from TR 36.843)

Deployment
- Option 1 (general) – only for discovery
- Option 5 (PS) – outdoor uniform – only for communication
  - Additional deployments can be optionally considered

TDD/FDD deployments
- FDD

Total number of UEs (including active UEsb) for discovery per cellc
- 150 discovery UEs/cell

QC suggests to consider 36.814 for the DL and UL traffic parameters (section A.2.2)

Agreements:
- The following work plan is proposed for RAN1:

- Companies are invited provide results on cellular impact by discovery and/or communication D2D in RAN1#77
  - Discovery and communication should be evaluated separately
  - Simulations assumptions according to TR 36.843
    - Focus on VoIP traffic model for D2D PS communication
  - In addition to metrics related to D2D performance (as in TR 36.843, section 10), the following metrics related to impact on cellular can be provided :
    - Mandatory performance metrics are those agreed in the TR, with and without D2D, with and without the potential solutions
    - Additionally, companies may provide other results (e.g., PUCCH BLER), with and without D2D, with and without the potential solutions
  - Discuss solutions at RAN1#77 and specify them in case of standard impact
- Companies are invited to discuss remaining simulation parameters that need to be harmonized to provide meaningful results.

Not treated.

R1-141139	Resource allocation for mode-1 communication	Huawei, HiSilicon	
R1-141163	Discussion on Multiplexing of Cellular and D2D Transmissions from System Perspective	Intel Corporation	
R1-141164	Discussion on D2D Operation within Network Coverage (Mode-1)	Intel Corporation	
R1-141209	Further considerations on multiplexing D2D and cellular signals	NEC	
R1-141257	D2D discovery channel resource allocation	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-141308	Resource allocation for type 2B discovery	Samsung	
R1-141327	Aspects of eNB Scheduling Assignment in D2D for Mode 1 Transmission	Sharp	
R1-141353	Operation in Type 2 resource allocation for D2D discovery	LG Electronics	
R1-141354	Issues on multiplexing between WAN and D2D	LG Electronics	
R1-141426	Resource Allocation for D2D Discovery	ZTE	
R1-141478	Discussion on the multiplexing of D2D and Cellular signals	ITRI	
R1-141499	Integrated resource scheduling for in-coverage D2D communication to support Mode 1 and Mode 2	III	
R1-141622	Discussion on multiplexing D2D and cellular signal	Potevio	
R1-141754	WF on eNB (Mode 1) resource allocation for communication	Qualcomm Incorporated, LG, ZTE, III, General Dynamics	

R1-141751	WF on multiplexing D2D transmission and reception	LG Electronics, Potevio, ETRI	

The document was presented by Younsum Kim from LGE.

- RAN1 to study further following issues:
  - Multiplexing D2D RX and WAN RX.
    - A UE that is equipped with a single receiver chain should be able to participate in D2D. This implies that such a UE may skip monitoring PDCCH in some subframes where it receives D2D signal.
  - Multiplexing D2D TX/RX and WAN TX
    - In order to minimize impact of TDM between D2D and WAN, some WAN TX (e.g., UL HARQ-ACK, UL HARQ retransmission) can be shifted to a non-D2D subframe.
  - Multiplexing D2D signals with different properties
    - UE behavior needs to be defined when two different D2D signals (e.g., signals with different transmit timing) overlap in time.
  - Details FFS

Decision: The document is noted. It is concluded that further study is needed until RAN1#77.

R1-141750	WF on WAN protection	LG Electronics, NTT Docomo, Samsung, Huawei, HiSilicon, KDDI	

Decision: The document is noted. Also supported by Sharp.

Observation:
Companies are encouraged to consider possible options (including implementation-based mechanisms) for WAN protection in case D2D and WAN resources are FDMed from system perspective.

Some possible options include:
- Option 1) Power control for D2D signal transmission
  - Note 1: Transmit power is controlled by eNB in Communication Mode 1 and discovery Type 2.
  - Note 2: Fixed power (non-UE specific) or open loop power control can be considered in Communication Mode 2 (if supported by in-coverage UEs) and discovery Type 1.
  - Note 3: Solutions to cope with D2D coverage difference when UE-specific transmit power control is applied is different should be considered.
- Option 2) RSRP measurement based resource selection restriction
- Option 3) Guard band between WAN and D2D resources
- Option 4) power boosting of WAN transmission
- Others including combination between options are not precluded.

R1-141752	WF on D2D Multicarrier UE Capabilities Assumptions	Ericsson, ALU, ASB, ITRI, Panasonic, IDCC	

Decision: The document is noted.

Proposal:
- At least in Rel-12, RAN1 ~~may~~ assumes that:
  - Carrier aggregation and dynamic carrier switching for D2D transmission are not supported.
  - D2D ~~operation~~ transmission ~~is constrained~~can only be configured on ~~to~~ a single carrier per UE at any given time, and
  - D2D transmission and reception can only be configured on the same carrier per UE at any given time.
- At least in Rel-12, ~~inter-frequency~~ D2D on a different carrier from the UE's WAN serving cell carrier is / is not supported.
- ~~If inter-frequency D2D is supported in Rel-12, a dedicated transceiver chain (transmitter and receiver) for D2D is assumed~~

Email discussion until RAN1#77 on what multi-carrier operations for D2D and WAN transmission/reception should be supported or excluded in Rel-12 – Stefano (Ericsson) (starting after 21st April).

7.2.7.2.3 Definitions of in-coverage, out-of-coverage, edge-of-cell coverage

Agreement in RAN2 #85:
- In Mode 1, the UE needs to be RRC Connected in order to transmit D2D communication

R1-141452	Definitions of coverage states and mode switching for D2D	Qualcomm Inc.	

The document was presented by Saurabha Tavildar from Qualcomm and proposes definitions for in-coverage and out-of-coverage, and discusses how to define mechanism for switching from Type 1 to Type 2 or vice versa.
- Proposal 1: names of Mode 1 and Mode 2 should be changed to Type 2 and Type 1 respectively to align terminology with discovery.
- Proposal 2: an explicit definition of edge-of-coverage is NOT required – only the definitions of mechanisms of type switching are needed.
- Proposal 3: A UE is considered out-of-coverage if it is NOT able to receive PSS, SSS, MIB, SIBs (including SIB for D2D communication) from eNB; else it is considered in-coverage.
- Proposal 4: measurement report based switch from Type 2 to Type 1 should be used
- Proposal 5: certain received power threshold is provided through SIB. Once this threshold is crossed, a UE gets into RRC_CONNECTED state, and switches from Type 1 to Type 2. A UE can keep on using Type 1 resources until it receives resources from eNB for Type 2.
- Proposal 6: Type 1 transitions between pre-configured or SIB-forwarded resource pool to SIB configured resource pool are done based on the UE state transition between in-coverage and out-of-coverage in either direction.

Discussion: Huawei→ too late for changing definitions - not need to capture definitions in specifications
Decision: The document is noted.

R1-141222	UE states and Resource allocation for D2D Communication	Panasonic	

The document was presented by Hidetoshi Suzuki from Panasonic and proposes the following:
- Proposal 1: To identify 4 UE states;
  - State 1 is both DL and UL eNB coverage.
  - State 2 is only DL eNB coverage.

- State 3 is not DL eNB coverage and eNB configured D2D resource information is obtained from the other D2D UE.
- State 4 is not DL eNB coverage and eNB configured D2D resource information is not obtained from the other D2D UE.

- Proposal 2: Whether to specify state 2 is FFS. If not specified, it is merged to state 3.
- Proposal 3: Resource allocation mode 1 Tx is only possible in state 1.
- Proposal 4: Resource allocation mode 2 Tx is supported in state 2, 3 and 4. It is FFS in state 1.
- Proposal 5: D2D UE is always capable to receive both mode 1 and mode 2 resource allocation in state 1/2/3. Mode 1 reception in state 4 is up to UE implementation.
- Proposal 6: The term "resource pool" is the resource on its own UE selects for mode 2. It is FFS on the relation between eNB configured D2D resource and resource pool.
- Proposal 7: Just to call state 1, state 2, state 3 and state 4 can be sufficient.

Decision: The document is noted.

R1-141141	Definition of coverage zones for D2D communication	Huawei, HiSilicon	

The document was presented by Philippe Sartori from Huawei and suggests coverage zones be defined based on a where defined:

- Proposal 1: A UE is in-coverage if ICT> T1, where T1 is a threshold.
- Proposal 2: A UE is out-of-coverage if ICT< T2, where T2 is a threshold.
- Proposal 3: A UE is at-edge-of-coverage if T1<ICT< T2.

Decision: The document is noted.

R1-141572	D2D Resource Allocation Mode Selection	Sony	

The document was presented by Matthew Webb from Sony and proposes:

- Coverage definition is based only on cell suitability criteria.
- Mode 2 is always used when out-of-coverage.
- Mode 1 is only used when the UE has an RRC connection.
- Conditions for use of mode 1 and/or mode 2 while in-coverage (whether idle or connected) are RAN2 scope.
- Procedures for selection and changing between mode 1 and mode 2 and/or triggering RRC connection procedures are in RAN2 scope.

Decision: The document is noted.

R1-141258	Discussion on in-coverage, out-of-coverage, and edge-of-cell coverage	Aclatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Fang Chen Cheng from ALU and proposes:

- Proposal 1: In coverage is defined as the area in which UEs have access to the LTE network.
- Proposal 2: Out-of-coverage is the area in which UEs do not have access to the LTE network.

The terms in-coverage and out-of-coverage are mutually exclusive, and the union of the two areas is the universal set – i.e. there are no points that are neither in-coverage nor out-of-coverage.

- Proposal 3: Edge-of-coverage is the area in which a UE's have access to only one eNB in the LTE network and meet the criteria of Event A2, which received signal strength from the strongest eNB is lower than the a configured threshold, for example the threshold for Event A2.

Decision: The document is noted.

R1-141742	WF on D2D Coverage Definitions	Ericsson, Huawei, HiSilicon, ZTE	

The document was presented by Stefano Sorrentino from Ericsson.

- A DL power measurement Z is defined, based on CRS from serving cell
- A transmitting UE is considered "In-coverage" if Z >= X dBm
- A transmitting UE is considered "edge-of-coverage" if Y dBm < Z < X dBm
- A transmitting UE is considered out-of-coverage if it is not in-coverage or edge-of-coverage
- {X,Y} can be pre-configured in the UEs and they can be signaled by the eNB
  - The signaled values of {X,Y} have higher priority than the pre-configured ones
- Methods to prevent ping-pong between coverage states, if needed, should be discussed in RAN2
- Note that the terms "in-coverage", "edge of coverage" and "out of coverage" are for discussion only and do not need to be captured in the specification.

Discussion: Also supported by Qualcomm.
Decision: The document is noted.

R1-141743	WF on Definition on In-Coverage, Edge-of-Cell Coverage and Out-of-Coverage	ITRI, KDDI, Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

The document was presented by … from ITRI.

- In-coverage: A UE has access to the network in both UL and DL.
  - FFS: RSRP is used for additional specification for coverage
- Out-of-coverage: A UE has no access to the network in either UL or DL.
- Cell-edge of coverage: A UE has access to the network with RSRP below threshold X dBm

– X is FFS.

Decision: The document is noted.

Possible agreement
- Mode 1 transmission is supported only for RRC_CONNECTED UE

Huawei: why does RAN1 need to agree it?
ALU: agrees with Huawei that the statement is technically similar to the already RAN2 agreement

Possible agreement
- Mode 1 can be used by UE if UE is enabled by the network
  Supported by: Fujitsu, ALU, ASB, Sharp, ITRI, ETRI, USDoC, GDBUK
- Mode 1 shall be used for D2D by UE if UE is enabled by the network
  Supported by Huawei, HiSilicon, Ericsson, LGE, Sharp, Telecom Italia, InterDigital, Fujitsu, ZTE

Agreement
- Mode 1 shall be used for D2D transmission under the conditions configured by NW for using Mode 1

Not treated.

R1-141309	Definitions of in-coverage, out-of-coverage, edge-of-cell coverage	Samsung	
R1-141328	D2D Coverage Definition	Sharp	
R1-141355	Definition of coverage in D2D operation perspective	LG Electronics	
R1-141389	On Metric and Procedures for In/Out of NW coverage detection for D2D	Ericsson	
R1-141428	Discussion on definitions of coverage scenarios	ZTE	
R1-141480	Definition of in-coverage, out-of-coverage and edge-of-cell coverage	ITRI	
R1-141547	Discussion on Out of Coverage Definition	Intel Corporation	
R1-141559	Determination of in-coverage, out-of-coverage, edge-of-coverage for D2D UEs	InterDigital	
R1-141564	Discussion on D2DSS design	Broadcom Corporation	

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R1-141840	WF on D2D Coverage Definitions	Ericsson, ALU, ASB, ITRI, Huawei, HiSilicon, Qualcomm, ZTE, LGE, USDoC, IDCC, GDB, DT	

Decision: The document is noted.

RAN2 agreements from RAN2#85bis:
1 A UE is considered in-coverage if it has a serving cell (CONNECTED) or is camping on a cell (IDLE).
2 If a UE is out of coverage it can only use mode 2.
3 If a UE is in coverage it may use mode 2 if the eNB configures it accordingly.
4 If a UE is in coverage it may use mode 1 if the eNB configures it accordingly.
4a If the UE is instructed to use mode 1, there may be exceptional cases where the UE is allowed to use mode 2 temporarily (criteria are FFS (e.g. if UE fails to establish an RRC connection….))
4b We intend to define the exceptional cases rather than an edge-of-coverage "state".

Agreement:
Send an LS to RAN2:
RAN1 thanks RAN2 for providing definitions of in-coverage and out-of-coverage.
In addition to RAN2's "may" conditions for using mode 1 and mode 2, RAN1 has also agreed that Mode 1 shall be used for D2D transmission under the conditions configured by NW for using Mode 1. RAN1 is therefore discussing the possibility of adding the following "shall" conditions for use of Mode 1 and Mode 2, although there is not currently consensus in RAN1 on introducing such conditions:
- A transmitting UE shall use Mode 2 if Z < X dBm or if no CRS is detected
- A transmitting UE shall use Mode 1 if Z >= Y dBm where Y>=X

where Z would be a defined DL power measurement based on CRS from the serving cell or the cell the UE is camping on, and X and Y could be pre-configured in the UEs and could be signaled by the eNB.

RAN1 would like to ask for RAN2's feedback on the possible addition of these criteria in order to assist RAN1 in reaching a decision.
RAN1 would also like to ask RAN2 for clarification on how the eNB carries out the configurations mentioned in RAN2's agreements 3 and 4.

R1-141817	LS to RAN2 on Modes 1&2	Ericsson	

Decision: The document is noted.
Add WI code.
Change title to "LS to RAN2 on D2D resource allocation Modes 1&2"
Accept change tracking.
Add "RAN1 would like to ask RAN2 to check the consistency of the above with their agreements"
Final LS is agreed in R1-141818.

Background:
Alt1: Send LS to RAN2 as above.
Huawei, HiSilicon, Telecom Italia, LG, CATT, Orange, ITRI, Ericsson, ALU, ASB, KDDI, ZTE, ETRI, Kyocera

Alt 2: Leave further specification of usage of Modes 1 and 2 to RAN2 and send no LS.
Sharp, NEC, Broadcom, Nokia, NSN, Samsung, Fujitsu, HTC

7.2.7.2.4 Other

Not treated.

R1-141237	Considerations D2D communication scheduling resource	Coolpad	
R1-141386	Inter-Carrier and Inter-Cell Aspects of D2D Discovery and Communication	Ericsson	

7.2.7.3 D2D synchronization

For both D2D discovery and broadcast communication

7.2.7.3.1 Resource allocation for synchronization signals and channels

Not treated.

R1-141196	Resource allocation for D2DSS and PD2DSCH	CATT	
R1-141259	Resource allocation for synchronization signals and channels	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-141356	Discussion on resource allocation for D2D synchronization	LG Electronics	
R1-141454	Resource allocation for D2D Synchronization	Qualcomm Inc.	
R1-141594	Views on resource allocation for D2D synchronization signals	Huawei, HiSilicon	
R1-141798	Resource allocation for synchronization signals enabling inter-cluster synchronization	Samsung	(R1-141310)

7.2.7.3.2 Synchronization signal and channel design

R1-141788	WF on D2D synchronization signal format	LG Electronics, Qualcomm, CATT	

The document was presented by Hanbyul Seo from LGE.

- A synchronization source transmits D2DSS periodically.
  - Target period not smaller than 100 ms.
    - FFS whether D2DSS period is configurable.
- To provide acceptable one-shot synchronization performance, more than one symbol is used for PD2DSS transmission in a subframe containing D2DSS.
  - FFS detailed structure
- PD2DSS is a length-63 ZC sequence.
  - FFS root index.
- Other details are FFS, e.g.,
  - Whether SD2DSS is necessary, and if so, how many symbols are used.
  - Whether D2DSS can be used to demodulate PD2DSCH if PD2DSCH is supported and transmitted in the same subframe.

Decision: The document is noted.

Working assumption:

- A synchronization source transmits D2DSS periodically
  - D2DSS period is not smaller than 40 ms
    - FFS whether D2DSS period is configurable/pre-defined, e.g., depending on scenarios

Possible working assumption
- More than one symbol is used for D2DSS transmission in a subframe containing D2DSS
  - FFS detailed structure
- Other details are FFS, e.g.,
  - Whether SD2DSS is necessary, and if so, how many symbols are used.
  - Whether D2DSS can be used to demodulate PD2DSCH if PD2DSCH is supported and transmitted in the same subframe.

Supported by: LGE, Qualcomm, GDBUK, CATT
Objection: ALU, ASB, ZTE, Ericsson, Samsung, Intel, Nokia, NSN

Working assumption:
- More than one symbol is used for D2DSS transmission in a subframe containing D2DSS
  - FFS detailed structure
  - FFS the number of PD2DSS symbols in the same subframe
  - FFS: Whether SD2DSS is necessary, and if so, how many symbols are used
  - FFS: Whether D2DSS can be used to demodulate PD2DSCH if PD2DSCH is supported and transmitted in the same subframe

R1-141789	WF on PD2DSCH	LG Electronics, Qualcomm, CATT, InterDigital	

The document was presented by Hanbyul Seo from LGE.
- PD2DSCH is supported for partial and out-coverage scenarios.
  - FFS whether PD2DSCH is supported for in-coverage scenario.
- D2DSS is transmitted in a subframe used for PD2DSCH transmission.
  - D2DSS and PD2DSCH in the same subframe are associated with each other.
- PD2DSCH carries:
  - System bandwidth
  - Information on the resources in which D2D transmission can/cannot occur, e.g.,
    - Resource pool used for D2D discovery, communication, and/or control
    - TDD UL/DL configuration for TDD carriers
  - Other information (FFS)
  - Note: the presence, length and mapping of the above fields may be different depending on the type of synchronization source, carrier type and possibly other parameters

Decision: The document is noted and it is concluded that further investigation is needed until RAN1#77 about the followings:
- Information on the resources in which D2D transmission can/cannot occur can be forwarded by D2D UE who obtained it from eNB
- Interference from out of coverage D2D UE to LTE NW
- Necessity of this information
- Inter-cell resource alignment

R1-141595	Design considerations for D2DSS	Huawei, HiSilicon	

The document (section 3) was presented by Fredrik Berggren from Huawei and proposes that:
- The D2DSS may be generated as one of
  - OFDM signal, or
  - SC-FDMA signal without DFT precoder.
- Higher-layer signalling solutions or specific D2DSS signal design may be used in order to differentiate D2DSS and PSS/SSS, if needed.
- The PD2DSS is based on a ZC sequence mapped to the subcarriers such that the time-domain signal becomes centrally symmetric.
  - Selection of sequence is FFS.
- The D2DSS should be transmitted in set of centrally located PRBs.
- The D2DSS could be transmitted in bursts in a periodic manner.

Decision: The document is noted.

Not treated.

R1-141166	Discussion on D2DSS Physical Structure	Intel Corporation	
R1-141197	Design of D2DSS and PD2DSCH	CATT	
R1-141260	Considerations for design of D2D Synchronization and UE Identification	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

R1-141312	Signal and channel design for synchronization source selection	Samsung	
R1-141357	Discussion on design of D2DSS and PD2DSCH	LG Electronics	
R1-141380	Synchronization Signals and Channel Design for D2D Discovery and Communication	Ericsson	
R1-141430	D2D Synchronization Signal and Channel Design	ZTE	
R1-141453	Signal Design for D2D Synchronization	Qualcomm Inc.	
R1-141520	Considerations on D2D synchronization signal design	ITL Inc.	
R1-141541	D2D synchronization signal design	Nokia, NSN	
R1-141548	Discussion on D2D Synchronization Channel (PD2DSCH)	Intel Corporation	
R1-141561	Synchronization signal and channel design for D2D	InterDigital	
R1-141652	ProSe device-to-device synchronisation signal and channel design	General Dynamics	
R1-141799	Synchronization signal design for inter-cluster synchronization	Samsung	(R1-141311)

7.2.7.3.3 Synchronization procedure

Mr Chair's recommendation: Note that inter-cell D2D is supported, but with no standardized inter-cell coordination based on X2 or air interface (i.e., no RAN1 discussion on inter-cell coordination)

R1-141804	WF on Synchronization Procedure	Qualcomm Incorporated, LG, III, General Dynamics, CATT, Fujistu	

The document was presented by Saurabha Tavildar from Qualcomm.

- For selection of a timing reference D2D synchronization source
  - D2D synchronization sources whose timing was originally derived from eNBs up to a maximum stratum level have a higher priority compared to the synchronization sources whose timing was originally derived from a UE.
  - The same prioritization rules should be applied for selection and reselection of the synchronization sources
- FFS on the remaining reselection details including
  - When a UE changes its reference synchronization source.
  - How a UE is provided with time to scan any change on the synchronization sources.
  - This includes the case where a UE re-evaluates whether to become or remain an independent synchronization source

Decision: The document is noted.

Agreement:

- For selection of a timing reference D2D synchronization source
  - The same prioritization rules should be applied for selection and reselection of the synchronization sources

Observations:

- FFS on the reselection details including
  - When a UE changes its reference synchronization source
  - How a UE is provided with time to scan any change on the synchronization sources
  - This includes the case where a UE re-evaluates whether to become or remain an independent synchronization source
  - Synchronization signal quality

R1-141805	WF on multi-hop for synchronization	ZTE, ALU, ASB, Qualcomm	

The document was presented by Yifei Yuan from ZTE.

- In out of coverage scenario, no stratum level to be defined for a synchronization source

Decision: The document is noted.

Agreement:

- D2DSS of synchronization source derived from eNB is different to D2DSS of synchronization source not derived from eNB

R1-141455	Procedures for D2D synchronization	Qualcomm Inc.	

The document was presented by Saurabha Tavildar from Qualcomm and proposes:

- Proposal 1: Adopt the procedure shown in Figure 2-1 as overall synchronization procedure on a given carrier with rules for selection/reselection of synchronization sources for further discussion.
- Proposal 2: The same prioritization rules should be applied for selection and reselection of the synchronization sources, when multiple sources are detected.
- Proposal 3: For in-network, UEs can select between multiple eNodeBs based on RSRP and earliest time of arrival.

- Proposal 4: Synchronization sources whose timing was originally derived from eNBs up to a pre-specified maximum stratum level have a higher priority compared to the synchronization sources which are following timings from ISS.
- Proposal 5: Among synchronization sources whose timing was originally derived from eNodeB, following rules are further used in that order (i) lower stratum levels (ii) earliest time of arrival.
- Proposal 6: partial network scenario should follow a hierarchical structure with eNodeBs at stratum 0.
- Proposal 7: out of network scenario should follow a flat structure.

Discussion:
Decision: The document is noted.

Not treated.

R1-141142	D2D Synchronization procedure in partial network coverage	Huawei, HiSilicon	
R1-141167	Analysis of the Amount of Timings for D2D Communication	Intel Corporation	
R1-141168	Discussion on D2D Synchronization Procedure	Intel Corporation	
R1-141198	Discussion on D2D synchronization procedure	CATT	
R1-141220	Rough synchronization procedure in D2D	Panasonic	(R1-140505)
R1-141261	D2D synchronization procedure	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-141313	Inter-cluster synchronization procedure	Samsung	
R1-141314	D2D Synchronization signal relay by UE	Samsung	
R1-141358	Discussion on D2D synchronization procedure	LG Electronics	
R1-141359	Discussion on D2D signal transmission and reception timing	LG Electronics	
R1-141360	Considerations on supporting inter-cell D2D operations	LG Electronics	
R1-141379	D2D Synchronization procedure between in and out of coverage UEs	HTC	
R1-141381	Synchronization Procedures for D2D Discovery and Communication	Ericsson	
R1-141385	Simulation Results for Multihop Synchronization	Ericsson	
R1-141432	Synchronization for D2D discovery	ZTE	
R1-141481	D2DSS Timing Misalignment for UE on Edge-of-Cell Coverage	ITRI	
R1-141498	Performance of D2D synchronization source selection and D2DSS transmission	III	
R1-141542	Discussion on D2D synchronization procedure for communication and discovery	Nokia, NSN	
R1-141550	On Reduction of Synchronization Source Density	Intel Corporation	
R1-141562	Synchronization procedure for D2D	InterDigital	
R1-141573	Synchronization design for D2D discovery and communication	Sony	
R1-141596	Timing signalling for D2D communication	Huawei, HiSilicon	
R1-141721	Considerations D2D Synchronization	Coolpad	(R1-141238)
R1-141723	Multi-hop Synchronization Procedure	ZTE	(R1-141431)

R1-141814	WF on D2D Synchronization Source	Qualcomm Incorporated, LG, III, Huawei, HiSilicon, General Dynamics, Kyocera	

Decision: The document is noted.

Agreement:

- For out-of-coverage
  - A UE can become a D2D Synchronization Source if received signal strength of all received D2DSS(s) by the UE are below X dBm
    - FFS on details of how to compute the received signal strength of a D2DSS
    - FFS for how long the received signal strength has to be below X dBm
    - The value of X dBm is pre-configured
    - The value of X can be infinite, i.e., every UE can become a D2D Synchronization Source
    - Set of other possible values of X is FFS
  - Other criteria under which a UE may become a D2D synchronization source are not precluded – FFS
  - Any possible conditions under which a UE shall not become or shall cease to be a D2D synchronisation source are FFS

- For in-coverage
  - A UE can become a D2D Synchronization Source at least if it is configured to do so by the eNB
    - FFS whether any additional criteria have to be met before a UE that is configured to become a D2D synchronization source can become one.
    - FFS whether any special UE reporting is needed to assist the eNB
  - FFS for other criteria, e.g. if the eNB has configured resources within which D2DSS may be transmitted
    - Consider interference impact to cellular in such cases.
  - FFS whether UEs in coverage have to be RRC connected in order to transmit D2DSS
  - Any possible conditions under which a UE shall not become or shall cease to be a D2D synchronisation source are FFS

R1-141815	WF on D2D Synchronization Resources	Qualcomm Incorporated, LG, Kyocera, General Dynamics	

Decision: The document is noted.

Agreement:
- For out-of-coverage UEs
  - Synchronization resources that occur periodically are used for transmitting D2DSS
    - FFS whether PD2DSCH (if supported) is transmitted
    - Size of a synchronization resource is FFS
      - It is fixed in specification
    - Periodicity of synchronization resources is pre-configured
  - Whenever a D2D Synchronization Source transmits on a synchronization resource, it transmits at least D2DSS on the synchronization resource, and receives at least D2DSS on other synchronization resource(s) (which may or may not be pre-configured)
    - Which synchronization resource is used for transmission is FFS
    - FFS: timing offset between transmit and receive resources
  - FFS: possible mechanism to handle the case of other out-of-coverage UEs transmitting on the same synchronization resource as the UE is transmitting on.
- Working Assumption: For both in-coverage and out-of-coverage, a synchronization resource for D2DSS occupies the 6 central RBs of a sub-frame

7.2.7.4 Other

R1-141456	Coexistence of D2D discovery and WAN	Qualcomm Inc.	

The document was presented by Shailesh Patil from Qualcomm and is summarized as follows:
- **Observation 1**: Uplink HARQ re-transmissions can collide with discovery transmissions.
- **Proposal 1**: D2D capable UEs should not transmit HARQ re-transmissions and SPS transmissions on resources reserved for discovery.
- **Observation 2**: For legacy UEs, eNodeB can suspend HARQ re-transmissions that can occur on discovery resources by transmitting an acknowledgement.
- **Observation 3**: When WAN and D2D discovery resources are FDM, WAN communication can be interfered with.
- **Observation 4**: FDM of WAN and D2D discovery resources should be minimized.
- **Proposal 2**: Sub-frames with resources for discovery should be interleaved with sub-frames on which only WAN signals are transmitted.
- **Proposal 3**: D2D capable UEs should participate in discovery on a sub-frame with discovery resources rather than transmit on PUCCH.
- **Proposal 4**: D2D capable UEs should prioritize PRACH over participation in discovery. Furthermore UEs should not transmit D2D discovery signal on resources reserved for PRACH.
- **Observation 5**: When short duration WAN signals such as SRS are TDM with D2D discovery signals there can be significant overhead and WAN signals can be interfered with.
- **Proposal 5**: D2D capable UEs should not transmit SRS on sub-frames with resources reserved for discovery.
- **Observation 6**: Since discovery is likely to be less than 1% of resources the impact of discovery on delay tolerant WAN traffic is limited. This is especially true when WAN and discovery sub-frames are interleaved.
- **Observation 7**: The impact on delay sensitive traffic needs more discussion especially because sub-frames with discovery resources will occur consecutively.
- **Proposal 6**: Delay tolerant traffic can be scheduled on interleaved sub-frames on which only WAN signals are transmitted.
- **Observation 8**: If a D2D capable UE uses one receive chain for receiving both downlink and discovery signals, then UE behaviour rules need to be defined for when a UE should receive downlink versus discovery signals.
- **Proposal 7**: D2D capable UEs with a single receiver chain should follow the following set of rules:
  - RRC_IDLE UEs should prioritize receiving paging messages on downlink over discovery.

- RRC_CONNECTED UEs not in DRX should prioritize RRM procedures over discovery.
- RRC_CONNECTED UEs not in DRX should prioritize SPS assignments over discovery.
- RRC_CONNECTED UEs not in DRX should prioritize discovery over receiving PDCCH assignments.

- **Observation 9**: Simulations confirm that the loss in WAN downlink and uplink throughput due to discovery is very small and minimal even when UEs use single receive chain.

Decision: The document is noted.

R1-141794	WF on Type 1 Discovery and WAN Coexistence	Qualcomm Incorporated, ZTE, Huawei, HiSilicon, Fujistu, III	

The document was presented by Shailesh Patil from Qualcomm.

- Release 12 UEs should not transmit HARQ re-transmissions and SPS transmissions on resources reserved for discovery.
- Release 12 UEs should participate in discovery on a sub-frame with discovery resources rather than transmit on PUCCH.
- Release 12 UEs should prioritize PRACH over participation in discovery. Furthermore UEs should not transmit D2D discovery signal on resources reserved for PRACH.
- Release 12 UEs should not transmit SRS on sub-frames with resources reserved for discovery.
- D2D capable UEs with a single receiver chain should follow the following set of rules:
  - RRC_IDLE UEs should prioritize receiving paging messages on downlink over discovery.
  - RRC_CONNECTED UEs not in DRX should prioritize RRM procedures over discovery.
  - RRC_CONNECTED UEs not in DRX should prioritize SPS assignments over discovery.

Decision: The document is noted.

Agreements:

- At least for D2D capable UEs with Type 1 discovery case (if enabled),
  - UEs shall prioritize PRACH over participation in discovery. Furthermore UEs should not transmit D2D Type 1 discovery signal on resources reserved for PRACH

Not treated

R1-141549	Analysis of different RSRP thresholds for design and evaluation of D2D communication	Intel Corporation	
R1-141597	Impact of D2D on cellular	Huawei, HiSilicon	
R1-141623	Impact of D2D on cellular traffic - Necessary further evaluations	Orange	

7.2.8 Network Assistance Interference Cancellation and Suppression for LTE

WID in RP-140519.

7.2.8.1 Higher-layer signalling

R1-141598	Discussion on network assistance signalling parameters	Huawei, HiSilicon	

The document was presented by Jianghua Liu from Huawei and deals with the network assistance signalling of NAICS receivers:

- Proposal 1: Parameters that can be signaled by higher-layer signalling from serving cell without network coordination are: cell ID, CRS antenna ports, MBSFN pattern, synchronization indication, CSI-RS configuration, QCL and P_B.
- Proposal 2: Parameters that can be signaled by higher-layer signalling from serving cell with subset restrictions include RA type, P_A, virtual cell ID (n_{ID}^{DMRS}) and how to evaluate the impact on performance is FFS.

Decision: The document is noted.

R1-141169	Discussion on higher layer signalling for NAICS	Intel Corporation	

The document was presented by Alexei Davydov from Intel and recommends the following parameters for specification:

- Cell ID, CRS and number of antenna ports, MBSFN subframe configuration
- CSI-RS parameters
- QCL parameters for UE-specific RS
- Virtual cell ID for PDSCH and ePDCCH
- Pb

The impact of the higher layer signaling on the resource allocation restriction and Pa restriction should be further investigated in RAN1 depending on the RAN4 study on blind detection of the interfering signal parameters. If dynamic parameter restriction is agreed in RAN1 / RAN4, there should be some explicit requirements that an eNB is mandated to follow the indicated restrictions. Therefore, some discussion on this requirement may be needed in RAN1.

Decision: The document is noted.

R1-141474	Views on Higher Layer Signaling for NAICS	NTT DOCOMO	

The document was presented by Kazuaki Takeda from NTT DoCoMo and concludes:

- Proposal 1: From the RAN1 perspective, parameters that do not require NW coordination should first be identified for higher layer signaling. The final decision regarding whether or not such parameters need to be indicated by higher layer signaling should be made after receiving RAN4 input.
- Observation: RAN1 could start with higher-layer signaling of the system bandwidth, synchronization indication, CSI-RS configuration, QCL, MBSFN pattern, and ρ_B/ρ_A without system-level evaluation. The final decision regarding which parameters need to be supported should be left to the discretion of RAN4.
- Proposal 2: Parameters for the NAICS receiver should be configured per component carrier.

Decision: The document is noted.

R1-141488	Higher-layer signalling for NAICS and system impact analysis	MediaTek Inc.	

The document was presented by Jeff Zhuang from MediaTek and proposes:

- Proposal 1: Defining network assistance signalling that can reduce the performance loss due to unreliable detection is as important as defining signalling to reduce the receiver complexity.
- Proposal 2: In addition to cell-ID, antenna ports, and MBSFN pattern, as defined in Rel-11, the following information corresponding to each cell ID can be defined and they are helpful to NAICS receivers
  - 1 bit to indicate that the cell can be considered as synchronized with the serving cell in terms of OFDM symbol timing and frequency, and also slot and SFN aligned
  - 1 bit to indicate CP length type
  - 3 bit for system bandwidth
- Proposal 3: RAN1 needs to discuss the smallest subsets of P_A that incurs minimal system performance impact and applicable to QPSK as well. Blind detection performance under that subset restriction can be evaluated in RAN4.
- Proposal 4: It is important to ensure UEs that at least a PRB pair can be used for blind detection, RAN1 should define RRC signalling to indicate to the UE that for a certain neighbor cell
  - LVRB is always used, or
  - DVRB is always used with N_{gap} fixed to either $N_{gap,1}$ or $N_{gap,2}$ (when system BW>=50 PRB)
- Proposal 5: RA granularity of multiple PRB-pairs (e.g., RBG in RA type 0 or PRG in TM9/10) can be very useful for blind detection. However, eNB may not be able to guarantee that UE can always assume PDSCHs will always fit and eNB may also use RA type 1 and type 2 instead, unless eNB wants to limit itself to a coarser granularity all the time in which case optional HL signalling can be defined.
- Proposal 6: Define three subset restrictions for the TM:
  - TM2 (TxD) and TM3 (large delay CDD + TxD)
  - TM4 (rank 1 or 2 with PMI) with TM6 (rank-1) as the degenerated case, where TxD can still be used as a fall-back scheme.
  - TM8/9/10 (rank-1 or 2) where TxD can be used as a fallback scheme.
- Proposal 7: PMI/RI subset restriction is for sure needed for 4-Tx eNBs. It requires careful study in RAN4 on candidate subset restriction under which blind detection is feasible in complexity and performance is acceptable.
- Proposal 8: Configuration information for all the CSI-RS (ports and offset/periodicity and [illegible] if configured) should be higher-layer signaled to the UEs.
- Proposal 9: A subset of virtual cell ID must also be signaled in case of TM10. The exact size of the subset needs further study in RAN4.
- Proposal 10: CFI of each cell can be provided in higher layer by the serving cell when fixing the CFI is acceptable.

Discussion: Ericsson questioned the intent of proposal 2 w.r.t CP length and system bandwidth
Decision: The document is noted.

R1-141515	Discussion on higher-layer signalling for NAICS	NVIDIA	

The document was presented by Tommi Koivisto from NVIDIA and proposes:

- The number of CRS ports and parameter P_B shall be signaled to the UE for each cell included in the network assistance information.
- Discuss further how to handle MBSFN subframe configuration, utilization of small cell on/off and eIMTA in the neighboring cell(s).
  - RAN4 actions may be needed to check whether reliable detection of CRS presence can be performed on a subframe basis assuming the knowledge of the number of CRS ports.
- UE may assume the same CP length and system bandwidth for all cells for which NA information has been configured.
- UE performance requirements should be developed (by RAN4) assuming a level of synchronization between serving and interfering cells, allowing single-FFT UE receiver implementation.
- UE may assume, or alternatively, the network could inform the UE whether the interference characteristics may be assumed constant over a number of consecutive PRBs, e.g. 1 PRG or 1 CQI subband.
- UE is signaled an assumed PDSCH start symbol for the interfering transmissions.
- Include in the higher-layer signaling a possibility of indicating a restricted subset of transmission modes assumed for the interfering transmission.

- Include in the higher-layer signaling a possibility of indicating a codebook subset restriction for the interfering transmission.
- Include in the higher-layer signaling the possibility of indicating a restricted subset of virtual cell IDs to be assumed for DMRS scrambling.
  - The default subset should contain only the physical cell ID of the interfering cell.
- Include in the higher-layer signaling the possibility of indicating to the UE a QCL assumption corresponding to the interfering PDSCH, including the reference CSI-RS resource in case of QCL type B.
- Study further whether additional information about CSI-RS utilized in the interfering cell need to be signaled.

Decision: The document is noted.

R1-141843	WF on NAICS Functionality Definition	Ericsson, NSN, Nokia, CATT, Nvidia, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Mark Harrison from Ericsson.

- NAICS functionality at least supports suppression of PDSCH and CRS interference
  - Assuming single FFT processing at the UE side considering realistic impairments
  - Such NAICS functionality is supported in all scheduled subframes
  - UE implementation is not restricted to suppress only CRS & PDSCH

Discussion: Debate whether first bullet was a common understanding.
Mr Chair suggested the following observation:

- NAICS functionality at least supports suppression of PDSCH and CRS interference
  - Assuming single FFT processing at the UE side considering realistic impairments

MediaTek commented that this is an issue led by RAN4 – RAN4 should confirm it
Decision: The document is noted.

R1-141844	WF on NAICS Signaling for 4 CRS Ports	Ericsson, Sprint, NSN, Nokia, CATT, NTT DoCoMo	

The document was presented by Mark Harrison from Ericsson.

- NAICS signaling supports 1, 2, and 4 CRS ports
  - Including mixed CRS port deployments, i.e. different number of CRS ports for different cells

Decision: The document is noted. No consensus to agree it. Mr Chair warned companies that NAICS will only be addressed on Wed session – next chance will be at next meeting. Continue offline discussion – Ericsson

Wednesday afternoon: attempt for a revised WF as:

- NAICS signaling supports 1, 2, and 4 CRS ports striving to limit differences in parameters signaled between different numbers of CRS ports
  - UE is aware of the number of CRS ports of interferers to which it may apply NAICS functionality
    - FFS if number of CRS ports is blindly detected vs. signaled
  - RAN4 assumed to determine feasibility for CRS port configurations, then set performance requirements accordingly
    - If additional signaling is needed, e.g. PMI subset restriction, can be studied in RAN4 (and provided by RAN1 as needed)
- NAICS signaling supports mixed CRS port deployments, i.e. different number of CRS ports for different cells

Conclusion:

- Further discussion is needed about NAICS signaling supports of 1, 2, and 4 CRS ports

Observation of Mr Chair: Higher-layer signalling of cell ID, CRS ports, MBSFN pattern, QCL, P_B can be considered.

Working assumption:

- Following parameter could be signalled by higher-layer signalling
  - Information related to P_B
  - Set of less than 8 power offset values
  - Subset of virtual cell ID
  - FFS: Cell ID, CRS ports, MBSFN pattern, QCL, Supported TM, signalling or restriction related to "no Type-2 distributed resource allocation", zero-power and non-zero-power CSI-RS, CFI
- Higher-layer signalling is configured per component carrier
- Further study is needed about blind detection or higher-layer signalling for system bandwidth, synchronization indication
- Prepare draft LS (R1-141855) to RAN4 until Wednesday afternoon – (Mediatek)

R1-141855	LS on RAN1 progress on NAICS higher-layer signalling	RAN1, MediaTek	

The document was presented by Jeff Zhuang from MediaTek.

Discussion: Correct WI code is LTE_NAICS-Core.
Qualcomm: typo correction as *signalling or restriction related to "no Type-2 distributed resource allocation"*
Correction agreed → revised working assumption as above.
Decision: The document is noted and the LS is agreed.

Not treated.

R1-141199	Considerations on higher-layer signalling for NAICS receiver	CATT	
R1-141221	Feasibility analysis of blind parameter detection on CRS-based transmission scheme	Panasonic	
R1-141262	Considerations on higher-layer signalling for NAICS	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-141315	Discussion on transmission parameters for NAICS	Samsung	
R1-141361	Discussion on higher-layer signalling for NAICS	LG Electronics	
R1-141409	Discussion on Higher-layer signalling for NAICS	ZTE	
R1-141457	Network assistance signalling	Qualcomm Inc.	
R1-141508	RRC signalling for NAICS	Broadcom Corporation	
R1-141543	Network assistance for NAICS receivers	NSN, Nokia	
R1-141599	Consideration onf higher layer signalling of NAIC	CATR	
R1-141653	Scenarios and higher-layer signalling for NAICS	Ericsson	
R1-141654	4 Tx Antenna Support for NAICS	Ericsson	
R1-141655	Higher Layer Signaling of TM10 DMRS Properties for NAICS	Ericsson	

7.2.8.2 CSI enhancement

R1-141841	WF on CSI enhancement for NAICS	LG Electronics, Ericsson, Intel, NTT DoCoMo	

The document was presented by Hyungtae Kim from LGE.

- CSI enhancements for Rel-12 NAICS receiver should be further studied, focusing on the following options.
  - Option 1: A single CSI feedback for NAICS
    - Option 1-1: CSI is derived after canceling/suppressing interference
      - Cancelation/suppression is assumed to use Rel-12 NAICS functionality, including interference channel estimation.
    - Option 1-2: CSI is derived without considering Rel-12 NAICS functionality (e.g. CSI after MMSE-IRC)
  - Option 2: Multiple CSI feedback for NAICS
    - Each CSI is derived based on different interference hypothesis.

Discussion: Mr Chair suggested looking at some of the contributions.
Decision: The document is noted.

R1-141362	Discussion on CSI enhancement for NAICS	LG Electronics	

The document was presented by Hyungtae Kim from LGE and concludes:

- Observation 1: CSI enhancement can provide significant performance gain under the assumption that UE perfectly knows interference condition at CSI calculation stage.
- Proposal 1: CSI enhancement should be considered to harvest NAICS gain.
- Proposal 2: Further study is needed on BD feasibility at CSI calculation stage, separately from BD feasibility at demodulation stage, and the impact of wrong detection of interference condition when calculating enhanced CSI.

Decision: The document is noted.

R1-141458	CSI measurement and reporting for NAICS	Qualcomm Inc.	

The document was presented by Hao Xu from Qualcomm and draws the following observations for NAICS:

- With a conservative reporting of non-clean CSI, NAIC receiver can still achieve early termination gain and additional gain with eNB outer loop adjustment.
- Accurate clean CSI reporting will depend on receiver type and UE implementation.
- For TM10, where feedbacks are based on CSI-RS and IMR, NAICS UE can follow the same reporting mechanism as already defined for Rel-11 non NAICS UEs.

Discussion: Ericsson questioned whether TM9 be emulated in TM4 framework? → TM9 deployment with a TM4 based simulation framework.
Decision: The document is noted.

R1-141656	On CSI enhancements for NAICS	Ericsson	

The document was presented by Lars Lindbom from Ericsson and deals with the issue of CSI reporting associated with e.g. SLIC receivers for which the demodulation SINR can fluctuate considerably due to a highly interference dependent cancellation efficiency. The following observation and proposal were made:

- Observation 1: Highly fluctuating SLIC SINR makes it hard for the link adaptation to translate SINR gains of SLIC into useful throughput gains
- Proposal 1: Consider CSI reporting that reflects different interference cancellation/suppression hypotheses

Decision: The document is noted.

R1-141410	Discussion on CSI enhancement for NAICS	ZTE	

The document was presented by … from ZTE and proposes three alternatives that need performance evaluation:

- Alt 1: Report one CSI process corresponding to the current NAICS receiver
- Alt 2: Report multiple CSI processes
- Alt 3: Report the traditional CSI with outer loop control method to adjustment

Proposal: Alt 3 is slightly preferred if Alt 1 and Alt 2 do not show much performance gain.
Decision: The document is noted.

R1-141143	Discussion on CSI enhancement for NAICS	Huawei, HiSilicon	

The document was presented by Jianghua Liufrom Huawei and concludes that the challenge for NAICS CSI measurement is that the interference signal structure to be canceled is unknown and would be difficult to be predicted at both UE and eNB sides.

- In order to further evaluate the candidate solutions, it is observed that the aggressive way to calculate CSI in case using OLLA at eNB seems acceptable.
- Proposal 1: it is proposed that the comparison between new candidate CSI enhancement scheme for NAICS and the aggressive way to calculate CSI when OLLA is enabled should be done.
- The assumptions of interference structure for wideband CQI and subband CQI calculation need further study.
- It would be more difficult to accurately predict RI, because the NAICS performance gain was unpredictable.
- Whether the bit width for subband differential CQI should be increased needs further study.

Decision: The document is noted.

R1-141316	Discussion on CSI enhancement for NAICS	Samsung	

The document was presented by … from Samsung and provides evaluation results that show BLER convergence to 0.1 for MMSE-IRC receiver and SLML receiver addressing the concern that NAICS receivers based on blind detection could violate the CQI definition in the current spec. It is observed that any special treatment for NAICS receivers in terms of CSI enhancement would not be needed in Rel-12.
Decision: The document is noted.

Back to WF in R1-141841.

Observation:

- CSI enhancements for Rel-12 NAICS receiver should be further studied until RAN1 #77 meeting, focusing on the following options
  - Option 1: A single CSI feedback for NAICS
    - Option 1-1: CSI is derived after canceling/suppressing interference
      - Cancelation/suppression is assumed to use Rel-12 NAICS functionality, including interference channel estimation
      - CSI calculation can be derived based on CRS, IMR, CSI-RS, and PDSCH
    - Option 1-2: CSI is derived after canceling/suppressing interference
      - Cancelation/suppression is assumed to use Rel-12 NAICS functionality, including interference channel estimation and blind detection
      - CSI calculation can be derived based on CRS, IMR, CSI-RS, and PDSCH
    - Option 1-3: CSI is derived without considering Rel-12 NAICS functionality (e.g. CSI after MMSE-IRC)
  - Option 2: Multiple CSI feedback for NAICS
    - Each CSI is derived based on different interference hypothesis

  Ex) CSI1 is derived after canceling/suppressing interference. CSI2 is derived after MMSE-IRC
- Further study is needed on the interference hypothesis and blind detection feasibility at CSI calculation stage

Possible observation:

- Companies should consider following additional evaluation assumptions of CSI enhancement in addition to TR36.866 evaluation assumptions in their system-level evaluation in RAN1 #77 meeting
  - 10% BLER target OLLA
  - Cell ID setting
  - Bursty traffic scenario with 0.1 Mbytes
    - Objected by Samsung, Qualcomm
    - Supported by Ericsson, Intel

Continue offline discussion until Friday by utilizing Tdoc R1-141857 – (Ericsson)
Friday 4th

R1-141857	Summary of offline discussions on CSI enhancement evaluations	Ericsson	

The document was presented by Lars Lindbom from Ericsson.
- Evaluations on CSI enhancements are conducted on system level and include bursty traffic scenarios.
- Subsequent evaluations are based on the assumptions captured in TR36.866
  - Following parameters to be provided with evaluations:
    - BLER target for the outer-loop
    - FTP packet size
    - Cell ID assignment method
    - CSI filtering used (if any)
    - Resources used to calculate CSI

Discussion: Mr Chair asked whether the above can be considered as final observation.
Samsung: what are bursty traffic scenarios to be considered? Ericsson → traffic models already captured in TR
Samsung: still would like to understand packet size for consideration
Decision: The document is noted, modified as follows:

Observation:
- Evaluations on CSI enhancements are conducted on system level and include FTP traffic model captured in TR36.866
- Subsequent evaluations are based on the assumptions captured in TR36.866
  - Following parameters to be provided with evaluations:
    - BLER target for the outer-loop
    - FTP packet size
    - Cell ID assignment method
    - CSI filtering used (if any)
    - Resources used to calculate CSI

Not treated.

R1-141170	Discussion on CQI enhancement for NAICS	Intel Corporation	
R1-141263	CQI reporting for NAICS operation	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-141475	Evaluation results of CSI enhancements for NAICS	NTT DOCOMO	
R1-141489	CSI feedback for NAICS receivers	MediaTek Inc.	
R1-141509	CSI reporting for NAICS	Broadcom Corporation	
R1-141516	On CSI feedback in support of NAICS	NVIDIA	
R1-141544	On NAICS CSI feedback	NSN, Nokia	R1-141838
R1-141619	CSI enhancement for NAICS receivers	CMCC	
R1-141838	On NAICS CSI feedback	NSN, Nokia	(R1-141544)

7.2.9 Other

Rel-12 UE capabilities

R1-141739	RAN1 excel sheet draft on LTE Rel-12 UE capabilities	NTT DoCoMo	

The document was presented by Kazuaki Takeda from NTT DoCoMo and provides a preliminary spreadsheet as RAN WGs need to prepare Rel-12 UE capability documents designating certain features as mandatory or optional (needs of network signalling) in order to help introducing signalling to support the optional feature implementations.
Discussion: Mr Chair→ Number of feature groups are oustanding info to RAN2.
AT&T questioned the intention of the so-called RAN5 implication column → not for RAN1 care according to Mr Chair
Decision: The document is noted. Mr Chair decided to allocate ad-hoc offline discussion during the week – (NTT DOCOMO)
Friday 4th

R1-141889	RAN1 excel sheet draft on LTE Rel-12 UE capabilities	NTT DoCoMo	(R1-141739)

The document was presented by Kazuaki Takeda from NTT DoCoMo.
Discussion: CMCC commented that UEs supporting FDD and TDD CA operation have to support TDD operation, and also to support TDD PCell HARQ timing.
Decision: The document is noted and finally agreed in R1-141893. Further updates will be required in RAN1#77 for the remaining FFS parts and further to the inclusion of eIMTA, Small Cell enhancements, D2D, NAICS and low cost MTC.

R1-141888	[Draft] LS on LTE Rel-12 UE feature list	NTT DoCoMo	R1-141897

Discussion: Attachment needs to be zipped all together with the LS.
CATT: LS should indicate that RAN1 couldn't reach consensus on whether 2-1 and 2-2 should be set together or separately for TDD-FDD CA.
LGE: RAN1 needs further study for some feature groups such as D2D, small cell enhancement, low cost MTC, eIMTA, and NAICS.
Decision: The document is noted and final LS is agreed as follows, assuming the addition of above statements:

R1-141897	LS on LTE Rel-12 UE feature list	RAN1, NTT DoCoMo	(R1-141888)

Rel-12 CRs

R1-141650	Draft CR to 36.211	Ericsson	

The document was presented by Daniel Larsson from Ericsson.
Discussion: Comments, if any, should be feedback to Daniel.
Decision: The document is noted.

R1-141726	Draft CR to 36.212	Huawei	

The document was presented by Brian Classon from Huawei and only focuses on new Rel-12 features.
Discussion: Comments, if any, should be feedback to Brian.
Decision: The document is noted.

R1-141736	Draft CR to 36.213	Motorola Mobility	

The document was presented by Robert Love from Motorola Mobility.
Discussion: Comments, if any, should be feedback to Bob.
Decision: The document is noted.

Conclusion: Check these Rel-12 CRs until Friday, and provide feedback to editors. Any agreements on new Rel-12 features (eIMTA, TDD-FDD CA, and Cov. enh.) made during the week or post meeting will be for email discussion until 21st April.
Editors will provide updated versions and, if any, open issue lists about CR editing until 22nd April
Email discussion until 19th May to have a check of above updated versions and open issue lists

8 Closing of the meeting

Mr Chair expressed his thanks to the RAN1 Vice Chairmen, as well as Carmela Cozzo and Karri Ranta-aho for chairing parallel HSPA sessions and to the Secretary Patrick Merias for his support.
He also thanked the different ad-hoc chairs, Kazuaki Takeda (sessions on UE capabilities), Zukang Shen (sessions on eIMTA), Eric Bouton (sessions on MTC) and Stefano Sorrentino (sessions on D2D).

Thanks to the host, ZTE, for organizing and providing the facilities.

Next meeting will be in Seoul, and main focus will be put on the updates of the Rel-12 CRs. Mr Chair recommended companies to provide their comments and inputs as soon as possible. Avoid any late comments in order to facilitate the work and life of the editors.

Finally, Mr Chair wished a safe journey back home to all and closed the meeting at 17:10.
See you all in Seoul.

Annex A: List of Tdocs at RAN1 #76bis

Please see excel file attached to this report

Annex B: List of CRs agreed at RAN1 #76bis

TS	CR	Rev	Rel	Title	Cat	Vsn	TD#	Source to WG	Work Item	Clauses affected
36.211	189	-	Rel-12	CR on antenna port definitions	F	12.1.0	R1-141895	Qualcomm Incorporated, Panasonic, Ericsson, Fujitsu	LTE-Phys, TEI12	6.2.1
36.212	0156	-	Rel-12	Clarification on UE antenna port based CRC masking	F	12.0.0	R1-141740	Qualcomm Inc.	LTE-Phys, TEI12	5.3.3.2
36.213	0459	1	Rel-12	Clarification on PUCCH reporting type payload size	F	12.1.0	R1-141894	Huawei, HiSilicon, Ericsson	LTE-Phys	7.2.2
36.212	0157	1	Rel-12	Correction on UCI multiplexing on PUSCH	F	12.0.0	R1-141898	Intel Corporation, NEC, Qualcomm Inc., Texas Instruments, Panasonic	LTE_CA-Core, TEI12	5.2.2.6

Annex C-1: List of Outgoing LSs from RAN1 #76bis

R1	Response to (Ic LS)	To	Cc	Title	Contact	Ref'd /Attachd Tdoc	Release	WI
R1-141755		R2, R3	R4	LS on Enhanced BCH parameters	Ericsson		Rel-12	UTRA_SIBenh
R1-141761		R2, R3	R4	LS on Progress in RAN1 #76bis for the UMTS Heterogeneous Networks WI	Huawei		Rel-12	UTRA_hetnet
R1-141813		R2		LS on identifier in scheduling assignment for D2D communication	Qualcomm		Rel-12	LTE_D2D_Prox-Core
R1-141816		R3		LS on Inter-eNB CoMP for LTE	Samsung		Rel-12	COMP_LTE_IeNB-Core
R1-141818		R2		LS to RAN2 on D2D resource allocation Modes 1&2	Ericsson		Rel-12	LTE_D2D_Prox
R1-141855		R4		LS on RAN1 progress on NAICS higher-layer signalling	MediaTek		Rel-12	LTE_NAICS-Core
R1-141869		R2		LS on the scheduling request transmission on the pSCell	NSN		Rel-12	LTE_SC_enh_dualC-Core
R1-141892		R3		LS on status of Radio-interface based synchronization	ZTE, Huawei		Rel-12	LTE_SC_enh_L1
R1-141897		R2	R3, R4	LS on LTE Rel-12 UE feature list	NTT DoCoMo	RAN1 UE feature list on Rel-12 LTE.xls	Rel-12	-
R1-141826		R2		LS on TP on eIMTA for 36.300	NSN	R1-141825, Draft TP on eIMTA for TS 36.300, NSN, Nokia, CATT	Rel-12	LTE_TDD_eIMTA
R1-141827		R2	R4	LS on RAN1 TDD-FDD CA outcome	Nokia		Rel-12	LTE_CA_TDD_FDD
R1-141757		R2, R3, R4		LS on RAN1 Decisions for Enhanced DCH Work Item	Qualcomm		Rel-12	UTRA_DCHenh
R1-141756		R2, R3, R4		LS on Further EUL Enhancements	Ericsson		Rel-12	EDCH_enh
R1-141890		R2, R4	R3	REPLY LS on resource allocation restriction and identification of low complexity MTC Ues	Vodafone		Rel-12	LC_MTC_LTE-core
R1-141828		R2		LS on updates of RRC parameters for LTE_TDD_eIMTA	CATT		Rel-12	LTE_TDD_eIMTA

Annex C-2: List of Incoming LSs from RAN1 #76bis

Source	Original Tdoc nbr	RAN1 Tdoc nbr	To	Cc	Title	Response to (Ic LS)	Release	WI	Contact
R2	R2-140891	R1-141103	R1, R3		LS on improvements to EUL coverage by TTI switching		Rel-12	EDCH_enh-Core	Ericsson
R2	R2-141003	R1-141104	R1		Reply LS on LTE coverage enhancement	R1-136065 (R2-140011)	Rel-12	Cov_Enh_LTE-Core	ZTE
R2	R2-141004	R1-141105	S2	R1, R3, R4	Reply LS to S2-133846 = R2-133066 on GCSE with eMBMS	S2-133846 (R2-133066)	Rel-12	FS_LTE_GC	Huawei
R2	R2-141007	R1-141106	R1		LS on RACH Aspects with eIMTA		Rel-12	LTE_TDD_eIMTA-Core	CATT
NGNM		R1-141107	NGNM	RAN, R1, R3	Liaison to 3GPP RAN, RAN1 and RAN3 on consolidated operator view on eCoMP standardization		Rel-12	-	NTT DoCoMo
R4	R4-140596	R1-141108	R2	R1	LS on deployment scenario for Intra-band Non-contiguous CA		Rel-11	LTE_CA_enh-Perf	NTT DoCoMo
R4	R4-141235	R1-141109	R1		Reply LS on half duplex FDD operation for Low complexity MTC UE	R1-134949	Rel-12	LC_MTC_LTE-Core	Huawei
R4	R4-141254	R1-141110	RAN	R1	LS on BS classes and maximum BS power on 256QAM		Rel-12	LTE_SC_enh_L1	Huawei
RAN	RP-140510	R1-141111	R4	R1	Reply LS to R4-141254 = RP-140024 on BS classes and maximum BS power on 256QAM	R4-141254 (R1-141110)	Rel-12	LTE_SC_enh_L1	Huawei
S2	S2-140846	R1-141112	R2, R3, R1, S1, S4, C4, C1		LS on GCSE QCIs and connected mode DRX		Rel-12	GCSE_LTE	Vodafone
S2	S2-140847	R1-141113	C1, C6, S3, R2, R1		LS on Provisioning of ProSe configuration information in a public safety ProSe enabled UE		Rel-12	-	Deutsche Telekom
R2	R2-141825	R1-141862	R1		Resource allocation restriction and identification of low complexity MTC Ues		Rel-12	LC_MTC_LTE-Core	Vodafone
S3	S3-140566	R1-141835	R2, R1		LS on parameter synchronization	R1-140941	Rel-12	FS_LTE_D2D_Prox	Qualcomm

Annex D: List of Approved updated WIDs

None

Annex E: List of draft TSs/TRs agreed at RAN1 #76bis

Tdoc Number	Title	Source	Conclusion/Decision
None			

Annex F: List of actions

- **Outgoing LS.**

[76b-01] Philippe (Huawei)

R1-141114	[DRAFT] LS on discovery message	Huawei, HiSilicon	

Email discussion/approval until 15th April
Done: According to Mr Chair's decision (email dated on April 17th), the discussion is postponed until next meeting as there was no consensus on the discovery message size from physical layer performance point of view.

[76b-07] Eric (Vodafone)

R1-141890	Reply LS on Resource allocation restriction and identification of low complexity MTC UEs	Vodafone	(R1-141866)

Email approval until 17th April
Done: According to Mr Chair's decision (email dated on April 18th), the LS is agreed.

[76b-13] Klaus (Nokia)

R1-141827	LS on RAN1 TDD-FDD CA outcome	RAN1, Nokia	

Email discussion/approval until 16th April
Done: According to Mr Chair's decision (email dated on April 17th), the LS is agreed.

[76b-21] Peyman (Qualcomm)

R1-141757	LS on RAN1 Decisions for Enhanced DCH Work Item	RAN1, Qualcomm	

Email discussion until 14th April
Done: According to Mr Chair's decision (email dated on April 15th), the LS is agreed.

[76b-23] Peter (Ericsson)

R1-141756	LS on Further EUL Enhancements	RAN1, Ericsson	

Email discussion/approval until 10th April
Done: According to Mr Chair's decision (email dated on April 11th), the LS is agreed.

- **CR approval**

[76b-02] Seunghee (Intel)

R1-141891	36.212 CR0157 (Rel-12, F) Correction on UCI multiplexing on PUSCH	Intel Corporation	(R1-141145)

Email approval until 10th April

Done: Revision 1 of CR0157 is agreed in R1-141898, as per decision made by Mr Chair on April 10th.

R1-141898	36.212 CR0157r1 (Rel-12, F) Correction on UCI multiplexing on PUSCH	Intel Corporation, NEC, Qualcomm Inc., Texas Instruments, Panasonic	(R1-141891)

[76b-03] Satoshi (RAN1 chair)

R1-141650	Draft CR to 36.211 (Rel-12)	Ericsson	
R1-141726	Draft CR to 36.212 (Rel-12)	Huawei	
R1-141736	Draft CR to 36.213 (Rel-12)	Motorola Mobility	

Email discussions under [76-211], [76-212], [76-213] for receiving comments on checking (R1-141650, R1-141726, R1-141736) until 21st April
Editors shall prepare updated versions (including RAN1#76bis decisions) and any open issue lists about CR editing until 22nd April
Email discussions under [76b-03-211], [76b-03-212], [76b-03-213] until 19th May to further check the updated versions and open issues about CR editing
Done: Updated versions shall be reviewed as input documents to RAN1#77.

- **Text proposal for TS and TR**

[76b-04] Timo (NSN)
TP on eIMTA for TS 36.300 and LS
Email discussion/approval until 10th April on the detailed text including LS to RAN2 when the final text is agreed
Done: RAN1 endorsed TP to RAN2 was agreed in R1-141825 on April 14th with the understanding that RAN2 shall prepare and accept the corresponding CR to 36.300. Final LS to RAN2 was agreed in R1-141826.

- **Miscellaneous**

[76b-05] Zukang (CATT)
Mapping of 2bit A-CSI triggering field for email discussion/approval until 10th April
Done: According to Mr Chair's email dated on April 11th, the following is agreed:

- **If a UE is configured with eIMTA and two Rel-12 CSI subframe sets on at least one serving cell, the 2-bit A-CSI triggering field in DCIs transmitted in UE specific search space can trigger A-CSI reporting according to the following table:**

Value of CSI request field	Description
'00'	No aperiodic CSI report is triggered
'01'	Aperiodic CSI report is triggered for a group of {CSI process(es)} and/or {CSI process(es) and Rel-12 subframe set(s)} configured by higher layers for serving cell c
'10'	Aperiodic CSI report is triggered for a 1st group of {CSI process(es)} and/or {CSI process(es) and Rel-12 subframe set(s)} configured by higher layers
'11'	Aperiodic CSI report is triggered for a 2nd group of {CSI process(es)} and/or {CSI process(es) and Rel-12 subframe set(s)} configured by higher layers

- **For a given serving cell, if the UE is configured in transmission modes 1-9, the "CSI process" in the above table refers to the aperiodic CSI configured for the UE on the given serving cell.**
- **The 1-bit A-CSI triggering field in DCIs transmitted in common search space triggers the A-CSI reporting corresponding to state of '01' in the above table, if the 1-bit A-CSI triggering field is set to '1'.**
- **A UE is not expected to be configured by higher layers with more than 5 CSI processes and/or {CSI process(es) and Rel-12 subframe set(s)} in each of the 1st and 2nd group of CSI process(es) and/or {CSI process(es) and Rel-12 subframe set(s)} in the above table.**
- **A UE is not expected to be configured by higher layers with more than one instance of the same CSI process in each CSI request field of 01, 10 and 11**

[76b-14]. This email thread was set to discuss the open issues pointed during the discussion of [76b-05]
Done: According to Mr Chair's email dated on April 17th, the following is agreed:

- **If a UE is configured with eIMTA and two subframe sets for uplink power control of a serving cell, the UE can be configured by RRC signaling with two sets of beta_{offset}^{PUSCH} (i.e. beta_{offset}^{HARQ-ACK}, beta_{offset}^{RI}, beta_{offset}^{CQI}) values, one for each UL subframe set for the serving cell. It is up to RAN2 to decide whether or not the beta_{offset}^{PUSCH} values are common to all serving cells.**
- **For a Rel-12 UE configured with eIMTA and TM 1 – 9 on a serving cell, the UE can be configured with up to 2 ZP-CSI-RS configurations. The UE shall perform PDSCH/EPDCCH RE mapping by rate matching around the configured ZP-CSI-RS configurations.**
- **For a Rel-12 UE configured with eIMTA, TM10, EPDCCH, and two Rel-12 CSI subframe sets on a serving cell, the UE can be configured with an additional csi-RS-ConfigZPId-r11 for each EPDCCH set for EPDCCH RE mapping. The UE shall perform EPDCCH RE mapping by rate matching around this additional ZP-CSI-RS configuration and the existing ZP-CSI-RS configuration indicated in the PQI associated with the EPDCCH. TM10 PDSCH RE mapping is the same as in Rel-11.**
- **For a Rel-12 UE configured with eIMTA, TM10, and two Rel-12 CSI subframe sets on a serving cell, the UE can be configured with separate Pc and codebook subset restriction for each of the two Rel-12 CSI subframe set of a CSI process.**
- **A UE is not expected to be configured with both Rel-10 eICIC subframe sets and Rel-12 CSI subframe sets for a serving cell. If a UE configured to determine the UL-DL configuration for a serving cell via monitoring the L1 reconfiguration DCI (i.e. the PDCCH scrambled by eIMTA-RNTI), the UE is not expected to be configured with the Rel-10 eICIC subframe sets on the serving cell.**

The RRC parameter list shall be updated taking into account the above agreements.

[76b-06] Zukang (CATT)
Updated RRC parameter list of eIMTA
Email approval until 17th April
Done: Updated RRC parameter list is agreed on April 24th and the list is forwarded to RAN2 via the following agreed LS.

R1-141828	LS on updates of RRC parameters for LTE_TDD_eIMTA	RAN1, CATT	

[76b-08] Fred (NTT DOCOMO)

R1-141863	Outcome of the offline discussion on TPC aspects of Dual Connectivity	NTT DoCoMo	

Email discussion/approval until 24th April including Question 7
Done: According to Mr Chair's email dated on May 2nd, the following is agreed:

Agreement related to Q0: Is dynamic power-sharing between two CGs/eNBs necessary?
- Continue discussion on exact mechanisms and specification impact to support dynamic power-sharing for dual connectivity in RAN1#77.
- Working assumption: dynamic power-sharing is supported.
  - FFS on which condition the dynamic power-sharing is supported.
  - FFS on whether the condition is specified or not.
  - FFS on what exactly the dynamic power-sharing is.

Agreement related to Q1: Are PMeNB and PSeNB (maximum transmit power per CG/eNB) need to be defined?
- Continue discussion in RAN1#77 on whether/how to specify PMeNB and PSeNB.
- Companies supporting to introduce PMeNB and PSeNB are encouraged to provide views on the following aspects.
  - Analysis on what the benefits of having PMeNB and PSeNB are.
  - How to specify PMeNB and PSeNB together with the proposal of power-control mechanisms?

Agreement related to Q2: In unsync case, how to define the power-limited case?
- Continue discussion in RAN1#77 what the definition of power-limited is, taking into account the exact power-control mechanisms of dual connectivity.
- FFS whether/how to specify synchronized and unsynchronized.

Agreement related to Q3'
- RAN1's baseline understanding is:

- If dynamic power-sharing between eNBs/CGs is introduced for unsynchronized case, and if prioritizing the first in time transmission is not introduced, UE needs to take into account of power requirement of the other eNB/CG before allocating its available power for the first eNB/CG, in the following two cases.
  - Case 1) When the first eNB/CG is MeNB/MCG,
  - Case 2) When the first eNB/CG is SeNB/SCG.

Note: The first eNB/CG is the eNB/CG which is earlier in the timing.
Note: "Taking into account" does not necessary mean to reduce the power.
Note: On-going transmission in a subframe should always be maintained.

- Continue discussion in RAN1#77 on whether this is actually applied to the unsynchronized case and what the priority order of the channels/signals between eNBs/CGs including the level of UE implementation flexibility is.

Agreement related to Q4: Is the additional processing time reduction (maximum close to 1ms) acceptable?
- Continue discussion in RAN1#77 together with the exact power-control mechanisms.

Agreement related to Q5: Is it allowable to keep some aspects as UE implementation matters?
- Revisit the Question 5 after RAN1 find high-level concepts of power-control of dual connectivity.

Agreement related to Q6: What should be decided in RAN1 and what in RAN4?
- RAN1 will send a LS to RAN4 after reaching high-level direction of power-control mechanisms (e.g., dynamic power-sharing is needed or not, PMeNB and PSeNB are defined or not, etc) so that RAN4 can start their work in an appropriate timing.

Agreement related to Q7
- RAN1 will assume that the maximum output power for each serving cell c shall not be exceeded even for dual connectivity.

The details of the email discussions are summarized in:

R1-141899	Outcome of the email discussion [76b-08] on TPC aspects of Dual Connectivity	NTT DoCoMo	

[76b-09] Hanbyul (LGE)
D2D signal gap
Email discussion until 15th May (RAN1 #77 meeting), to prepare a list of all relevant cases to identify which ones need a gap and which do not
Done: Email discussion summary shall be reviewed in RAN1#77.

[76b-10] Yan-Xiu (ITRI)
Discovery preamble for D2D
Email discussion until 15th May (RAN1 #77 meeting), discuss further whether the first symbol data is sufficient for AGC or whether a different preamble is needed
Done: Email discussion summary shall be reviewed in RAN1#77.

[76b-11] Shailesh (Qualcomm)
Simulation baseline for D2D for email discussion until 10th April
Done: Summarized simulation assumptions are agreed in R1-141820 according to Mr Chair's decision date on April 20th.

R1-141820	Simulation assumptions for impact of D2D on WAN - agreements from [76b-11]	Qualcomm Incorporated (rapporteur)	

[76b-12] Stefano (Ericsson)
Multi carrier operation for D2D
Email discussion until 15th May (RAN1 #77 meeting) on what multi-carrier operations for D2D and WAN transmission/reception should be supported or excluded in Rel-12
Done: Email discussion summary shall be reviewed in RAN1#77.

[76b-20] Peyman (Qualcomm)
Remaining issues of DCH enh.
Email discussion until 24th April
Done: Email discussion summary shall be reviewed in RAN1#77.

[76b-22] Peter (Ericsson)

R1-141762	Evaluation scenarios for Further EUL Enhancements	Ericsson	

Email discussion/approval until 10th April
Done: Evaluation scenarios are agreed, according to decision of Mr Chair on April 17th.

Annex G: List of participants at RAN1 #76bis

Please see excel file attached to this report

Annex H: TSG RAN WG1 meetings in 2014 - 2015

TITLE	TYPE	DATES	LOCATION	CTRY
3GPPRAN1#77	WG	19 – 23 May 2014	Seoul	KR
3GPPRAN1#78	WG	18 – 22 Aug 2014	Dresden	Germany
3GPPRAN1#78bis	WG	6 – 10 Oct 2014	Ljubljana	Slovenia
3GPPRAN1#79	WG	17 – 21 Nov 2014	San Francisco	US
3GPPRAN1#80	WG	9 – 13 Feb 2015	Athens	Greece
3GPPRAN1#80bis	WG	20 – 24 Apr 2015	Belgrade	Serbia
3GPPRAN1#81	WG	25 – 29 May 2015	TBD	Japan
3GPPRAN1#82	WG	24 – 28 Aug 2015	TBD	China
3GPPRAN1#82bis	WG	5 – 9 Oct 2015	TBD	TBD
3GPPRAN1#83	WG	16 – 20 Nov 2015	TBD	US

MEETING TYPES	
AH = Ad Hoc	CM = Chairmen's meeting
JM = Joint	OR = Ordinary
PM = Preparatory Meeting	RG = Rapporteurs Group
RM = Resolution Meeting	SG = Steering Group
ST = Startup Meeting	TG = Task Group
WG = Working Group	XO = Extraordinary

End of document

Appendix 28

www.3gpp.org / ftp / tsg_ran / WG1_RL1 / TSGR1_76 / Docs

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R1-140222.zip	2014/02/01 10:55	413,2 KB
R1-140223.zip	2014/02/01 10:55	13,5 KB
R1-140224.zip	2014/02/01 10:55	19,8 KB
R1-140225.zip	2014/02/01 10:55	244,7 KB
R1-140227.zip	2014/02/01 10:55	218,8 KB
R1-140228.zip	2014/02/01 10:56	431,7 KB
R1-140229.zip	2014/01/31 20:23	63,3 KB
R1-140230.zip	2014/01/31 20:23	64,5 KB
R1-140231.zip	2014/01/31 20:23	94,3 KB
R1-140232.zip	2014/01/31 20:23	23,3 KB
R1-140233.zip	2014/01/31 20:23	276,6 KB
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R1-140239.zip	2014/02/01 10:56	33,1 KB

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R1-140248.zip	2014/02/01 10:56	33 KB
R1-140249.zip	2014/02/01 10:56	36,5 KB
R1-140250.zip	2014/02/01 10:56	402,4 KB
R1-140251.zip	2014/02/01 10:56	118,4 KB
R1-140252.zip	2014/02/01 10:56	399,5 KB
R1-140253.zip	2014/02/01 10:56	150,3 KB
R1-140254.zip	2014/02/01 10:56	51,2 KB
R1-140255.zip	2014/02/01 10:56	457,8 KB
R1-140256.zip	2014/02/01 10:56	52,6 KB
R1-140257.zip	2014/01/31 20:23	185,9 KB
R1-140258.zip	2014/02/01 10:56	240,3 KB
R1-140259.zip	2014/02/01 10:56	53,2 KB
R1-140260.zip	2014/01/31 20:23	341,2 KB
R1-140261.zip	2014/01/31 20:23	156,4 KB
R1-140262.zip	2014/01/31 20:23	64,8 KB
R1-140263.zip	2014/01/31 20:23	35,8 KB
R1-140264.zip	2014/02/01 10:56	303,3 KB
R1-140265.zip	2014/02/01 10:56	55,7 KB
R1-140266.zip	2014/02/01 10:56	50,7 KB
R1-140267.zip	2014/02/01 10:56	78,8 KB
R1-140268.zip	2014/02/01 10:56	48 KB
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R1-140270.zip	2014/01/31 20:23	28,7 KB
R1-140271.zip	2014/01/31 20:23	156 KB
R1-140272.zip	2014/01/31 20:23	73,6 KB
R1-140273.zip	2014/01/31 20:23	123,2 KB

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R1-140293.zip	2014/02/01 10:57	439,5 KB
R1-140294.zip	2014/02/01 10:57	20,8 KB
R1-140295.zip	2014/02/01 10:57	19,3 KB
R1-140296.zip	2014/02/01 10:57	44,7 KB
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R1-140298.zip	2014/02/01 10:57	35,4 KB
R1-140299.zip	2014/02/01 10:57	42,9 KB
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R1-140304.zip	2014/02/01 10:57	31,5 KB
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R1-140306.zip	2014/02/01 10:57	203,8 KB
R1-140307.zip	2014/02/01 10:57	23,3 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-140316.zip	2014/02/01 10:57	21,1 KB
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R1-140318.zip	2014/02/01 10:57	24,9 KB
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R1-140321.zip	2014/02/01 10:57	27,7 KB
R1-140322.zip	2014/02/01 10:57	42,1 KB
R1-140323.zip	2014/02/01 10:57	65,6 KB
R1-140324.zip	2014/02/01 10:58	143,9 KB
R1-140325.zip	2014/02/01 10:58	185,3 KB
R1-140326.zip	2014/02/01 10:58	675,6 KB
R1-140327.zip	2014/02/01 10:58	33,3 KB
R1-140328.zip	2014/02/01 10:58	29,9 KB
R1-140329.zip	2014/02/01 10:58	154,3 KB
R1-140330.zip	2014/02/01 10:58	511,5 KB
R1-140331.zip	2014/02/01 10:58	61,3 KB
R1-140332.zip	2014/02/01 10:58	798,9 KB
R1-140333.zip	2014/02/01 10:58	373,5 KB
R1-140334.zip	2014/02/01 10:58	165,5 KB
R1-140335.zip	2014/02/01 10:58	234,6 KB
R1-140336.zip	2014/02/01 10:58	210,6 KB
R1-140337.zip	2014/02/01 10:58	113,4 KB
R1-140338.zip	2014/02/01 10:58	56,9 KB
R1-140339.zip	2014/02/01 10:58	209,1 KB
R1-140340.zip	2014/02/01 10:58	41,2 KB
R1-140341.zip	2014/02/01 10:58	29,8 KB

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R1-140348.zip	2014/02/01 10:58	48,7 KB
R1-140349.zip	2014/02/01 10:58	47,2 KB
R1-140350.zip	2014/02/01 10:58	108,3 KB
R1-140351.zip	2014/02/01 10:59	575 KB
R1-140352.zip	2014/02/01 10:59	56 KB
R1-140353.zip	2014/02/01 10:59	42,6 KB
R1-140354.zip	2014/02/01 10:59	46,1 KB
R1-140355.zip	2014/02/01 10:59	54,1 KB
R1-140356.zip	2014/02/01 10:59	57,9 KB
R1-140357.zip	2014/02/01 10:59	43,8 KB
R1-140358.zip	2014/02/01 10:59	45,9 KB
R1-140359.zip	2014/02/01 10:59	83,8 KB
R1-140360.zip	2014/02/01 10:59	63,1 KB
R1-140361.zip	2014/02/01 10:59	238,4 KB
R1-140362.zip	2014/02/01 10:59	76 KB
R1-140363.zip	2014/02/01 10:59	48,4 KB
R1-140364.zip	2014/02/01 10:59	44,2 KB
R1-140365.zip	2014/02/01 10:59	128,4 KB
R1-140366.zip	2014/02/01 10:59	44,3 KB
R1-140367.zip	2014/02/01 10:59	411,3 KB
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R1-140370.zip	2014/02/01 10:59	159,3 KB
R1-140371.zip	2014/02/01 10:59	531 KB
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R1-140374.zip	2014/02/01 10:59	41,5 KB
R1-140375.zip	2014/02/01 10:59	57,2 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-140382.zip	2014/02/01 10:59	48,7 KB
R1-140383.zip	2014/02/01 11:00	3022,8 KB
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R1-140393.zip	2014/02/01 11:00	502,3 KB
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R1-140395.zip	2014/02/01 11:01	669,1 KB
R1-140396.zip	2014/02/01 11:01	167 KB
R1-140397.zip	2014/02/01 11:01	76,8 KB
R1-140398.zip	2014/02/01 11:01	76,9 KB
R1-140399.zip	2014/02/01 11:01	353,7 KB
R1-140400.zip	2014/02/01 11:01	23,1 KB
R1-140401.zip	2014/01/31 20:24	40,6 KB
R1-140402.zip	2014/01/31 20:24	27,9 KB
R1-140403.zip	2014/01/31 20:24	18,5 KB
R1-140404.zip	2014/01/31 20:24	548,9 KB
R1-140405.zip	2014/01/31 20:24	389,9 KB
R1-140406.zip	2014/01/31 20:24	90,2 KB
R1-140407.zip	2014/01/31 20:24	343,1 KB
R1-140408.zip	2014/01/31 20:24	275,2 KB
R1-140409.zip	2014/01/31 20:24	199,9 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-140413.zip	2014/02/01 11:01	69,9 KB
R1-140414.zip	2014/01/31 20:24	28,3 KB
R1-140415.zip	2014/01/31 20:24	81,4 KB
R1-140416.zip	2014/01/31 20:24	57,4 KB
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R1-140418.zip	2014/01/31 20:24	17 KB
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R1-140424.zip	2014/01/31 20:24	376 KB
R1-140425.zip	2014/01/31 20:24	40,3 KB
R1-140426.zip	2014/02/01 11:01	20,2 KB
R1-140427.zip	2014/02/01 11:01	20,7 KB
R1-140428.zip	2014/01/31 20:24	136,4 KB
R1-140429.zip	2014/01/31 20:24	19,3 KB
R1-140430.zip	2014/01/31 20:24	83,3 KB
R1-140431.zip	2014/01/31 20:24	66,7 KB
R1-140432.zip	2014/02/01 11:01	37 KB
R1-140433.zip	2014/02/01 11:01	35,1 KB
R1-140434.zip	2014/02/01 11:01	28,7 KB
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R1-140442.zip	2014/02/01 11:01	35,8 KB
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R1-140462.zip	2014/02/01 11:02	105,7 KB
R1-140463.zip	2014/02/01 11:02	199,5 KB
R1-140464.zip	2014/02/01 11:02	344,6 KB
R1-140465.zip	2014/02/01 11:02	55,6 KB
R1-140466.zip	2014/02/01 11:02	118,4 KB
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R1-140468.zip	2014/02/01 11:02	63,9 KB
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R1-140471.zip	2014/02/01 11:02	42,4 KB
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R1-140477.zip	2014/02/01 11:02	37,4 KB

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R1-140485.zip	2014/01/31 20:25	306 KB
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R1-140499.zip	2014/02/17 9:50	48,5 KB
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R1-140503.zip	2014/01/31 20:25	53,8 KB
R1-140504.zip	2014/01/31 20:25	90,4 KB
R1-140505.zip	2014/01/31 20:25	213 KB
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R1-140507.zip	2014/01/31 20:25	132,7 KB
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R1-140509.zip	2014/01/31 20:25	27,5 KB
R1-140510.zip	2014/01/31 20:25	27,9 KB
R1-140511.zip	2014/01/31 20:25	33 KB
R1-140512.zip	2014/01/31 20:25	64,8 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-140518.zip	2014/02/01 11:02	63,9 KB
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R1-140520.zip	2014/02/01 11:03	132,3 KB
R1-140521.zip	2014/02/01 11:03	39,3 KB
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R1-140525.zip	2014/02/01 11:03	150,6 KB
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R1-140529.zip	2014/02/01 11:03	29,4 KB
R1-140530.zip	2014/02/01 11:03	43,7 KB
R1-140531.zip	2014/02/01 11:03	41 KB
R1-140532.zip	2014/02/01 11:03	29,6 KB
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R1-140535.zip	2014/02/01 11:03	29,2 KB
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R1-140537.zip	2014/02/01 11:03	29,7 KB
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R1-140545.zip	2014/02/01 11:03	71 KB
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sort by name/desc	sort by date/desc	sort by size/desc
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R1-140556.zip	2014/01/31 20:25	20 KB
R1-140557.zip	2014/02/01 11:03	35,4 KB
R1-140558.zip	2014/02/01 11:03	21,5 KB
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R1-140562.zip	2014/02/01 11:03	418,2 KB
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R1-140568.zip	2014/02/01 11:04	35,6 KB
R1-140569.zip	2014/02/01 11:04	15,3 KB
R1-140570.zip	2014/02/01 11:04	15,1 KB
R1-140571.zip	2014/01/31 20:25	165,5 KB
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R1-140574.zip	2014/01/31 20:25	83,7 KB
R1-140575.zip	2014/01/31 20:25	40,3 KB
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R1-140581.zip	2014/01/31 20:25	21,8 KB

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R1-140588.zip	2014/02/01 11:04	33 KB
R1-140589.zip	2014/02/01 11:04	169 KB
R1-140590.zip	2014/02/01 11:04	34 KB
R1-140591.zip	2014/01/31 20:25	187,5 KB
R1-140592.zip	2014/01/31 20:25	23,4 KB
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R1-140594.zip	2014/01/31 20:25	328,7 KB
R1-140595.zip	2014/01/31 20:26	412,8 KB
R1-140596.zip	2014/01/31 20:26	23,9 KB
R1-140597.zip	2014/01/31 20:26	41 KB
R1-140598.zip	2014/01/31 20:26	47,3 KB
R1-140599.zip	2014/02/17 9:50	940,4 KB
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R1-140601.zip	2014/01/31 20:26	74,1 KB
R1-140602.zip	2014/01/31 20:26	57,8 KB
R1-140603.zip	2014/01/31 20:26	93,1 KB
R1-140604.zip	2014/01/31 20:26	265,3 KB
R1-140605.zip	2014/01/31 20:26	51,4 KB
R1-140606.zip	2014/01/31 20:27	2505,7 KB
R1-140607.zip	2014/02/01 11:05	37,4 KB
R1-140608.zip	2014/02/01 11:05	392,6 KB
R1-140609.zip	2014/02/01 11:05	149,9 KB
R1-140610.zip	2014/02/01 11:05	246,6 KB
R1-140611.zip	2014/02/01 11:05	26 KB
R1-140612.zip	2014/02/01 11:05	36,1 KB
R1-140613.zip	2014/02/01 11:05	95 KB
R1-140614.zip	2014/02/01 11:05	53,5 KB
R1-140615.zip	2014/02/01 11:05	151,8 KB

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R1-140624.zip	2014/02/01 11:05	36,6 KB
R1-140625.zip	2014/02/01 11:05	91,1 KB
R1-140626.zip	2014/02/01 11:05	73 KB
R1-140627.zip	2014/02/01 11:05	118,3 KB
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R1-140629.zip	2014/02/01 11:05	98,2 KB
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R1-140633.zip	2014/02/01 11:05	46,8 KB
R1-140634.zip	2014/02/01 11:05	49,3 KB
R1-140635.zip	2014/02/01 11:05	70,7 KB
R1-140636.zip	2014/02/01 11:05	25,8 KB
R1-140637.zip	2014/02/01 11:05	99,1 KB
R1-140638.zip	2014/02/01 11:05	99,2 KB
R1-140639.zip	2014/02/01 11:05	40,8 KB
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R1-140645.zip	2014/02/01 11:06	49,5 KB
R1-140646.zip	2014/02/01 11:06	38,2 KB
R1-140647.zip	2014/02/01 11:06	59,4 KB
R1-140648.zip	2014/02/01 11:06	48,6 KB
R1-140649.zip	2014/02/01 11:06	26,3 KB

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R1-140653.zip	2014/02/01 11:06	322,2 KB
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R1-140658.zip	2014/02/01 11:06	359,4 KB
R1-140659.zip	2014/02/01 11:06	30 KB
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R1-140661.zip	2014/01/31 20:27	77,6 KB
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R1-140663.zip	2014/01/31 20:27	21 KB
R1-140664.zip	2014/01/31 20:27	148,7 KB
R1-140665.zip	2014/01/31 20:27	154,3 KB
R1-140666.zip	2014/01/31 20:27	105,8 KB
R1-140667.zip	2014/02/01 11:06	35,3 KB
R1-140668.zip	2014/02/01 11:06	65,7 KB
R1-140669.zip	2014/02/01 11:06	38,3 KB
R1-140670.zip	2014/02/01 11:06	21,9 KB
R1-140671.zip	2014/02/01 11:06	19,4 KB
R1-140672.zip	2014/02/01 11:06	46,2 KB
R1-140673.zip	2014/02/01 11:06	10,3 KB
R1-140674.zip	2014/02/01 11:06	10 KB
R1-140675.zip	2014/02/01 11:06	16,9 KB
R1-140676.zip	2014/02/01 11:06	107 KB
R1-140677.zip	2014/02/01 11:06	231,1 KB
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R1-140679.zip	2014/02/01 11:06	21,1 KB
R1-140680.zip	2014/02/01 11:06	29,4 KB
R1-140681.zip	2014/02/01 11:06	368,9 KB
R1-140682.zip	2014/02/01 11:06	216,7 KB
R1-140683.zip	2014/02/01 11:06	49,1 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-140686.zip	2014/02/01 11:07	1012 KB
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R1-140688.zip	2014/02/01 11:07	308,8 KB
R1-140689.zip	2014/02/01 11:07	114 KB
R1-140690.zip	2014/02/01 11:07	34,4 KB
R1-140691.zip	2014/02/01 11:07	177,6 KB
R1-140692.zip	2014/02/01 11:07	539,3 KB
R1-140693.zip	2014/02/01 11:07	25,8 KB
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R1-140695.zip	2014/02/01 11:07	159,9 KB
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R1-140697.zip	2014/02/01 11:07	219,3 KB
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R1-140702.zip	2014/02/01 11:07	51,1 KB
R1-140703.zip	2014/02/01 11:07	72,4 KB
R1-140704.zip	2014/02/01 11:07	187,2 KB
R1-140705.zip	2014/02/01 11:07	45,8 KB
R1-140706.zip	2014/02/01 11:07	98,8 KB
R1-140708.zip	2014/02/01 11:07	157,6 KB
R1-140709.zip	2014/02/01 11:07	72,6 KB
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R1-140711.zip	2014/02/01 11:07	173,9 KB
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R1-140715.zip	2014/02/01 11:08	99,2 KB
R1-140716.zip	2014/02/01 11:08	93,7 KB
R1-140717.zip	2014/02/01 11:08	33,5 KB
R1-140718.zip	2014/02/01 11:08	54,2 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-140722.zip	2014/02/01 11:08	221,5 KB
R1-140723.zip	2014/02/01 11:08	82,4 KB
R1-140724.zip	2014/02/01 11:08	63,9 KB
R1-140725.zip	2014/02/01 11:08	124,8 KB
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R1-140727.zip	2014/02/01 11:08	126,3 KB
R1-140728.zip	2014/01/31 20:27	13,6 KB
R1-140729.zip	2014/01/31 20:27	15,9 KB
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R1-140731.zip	2014/01/31 20:27	32,6 KB
R1-140732.zip	2014/01/31 20:27	33,2 KB
R1-140733.zip	2014/01/31 20:27	27,8 KB
R1-140734.zip	2014/01/31 20:27	10,1 KB
R1-140735.zip	2014/01/31 20:27	10,7 KB
R1-140736.zip	2014/01/31 20:27	10,4 KB
R1-140737.zip	2014/01/31 20:27	15,4 KB
R1-140738.zip	2014/01/31 20:27	11,1 KB
R1-140739.zip	2014/02/01 11:08	18,8 KB
R1-140740.zip	2014/02/01 11:08	21,4 KB
R1-140741.zip	2014/02/01 11:08	19,6 KB
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R1-140743.zip	2014/02/01 11:08	20,6 KB
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R1-140746.zip	2014/02/01 11:08	17 KB
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R1-140748.zip	2014/02/01 11:08	17,3 KB
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R1-140752.zip	2014/01/31 20:27	41,3 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-140762.zip	2014/01/31 20:27	10,6 KB
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R1-140765.zip	2014/02/01 11:08	387 KB
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R1-140767.zip	2014/02/01 11:08	27,2 KB
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R1-140769.zip	2014/02/01 11:08	88,7 KB
R1-140770.zip	2014/02/01 11:08	125,2 KB
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R1-140775.zip	2014/01/31 20:27	105,9 KB
R1-140776.zip	2014/01/31 20:27	214,9 KB
R1-140777.zip	2014/01/31 20:27	51,8 KB
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R1-140779.zip	2014/02/01 11:08	38,6 KB
R1-140780.zip	2014/01/31 20:27	126,3 KB
R1-140781.zip	2014/01/31 20:27	14,3 KB
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R1-140803.zip	2014/02/01 11:09	33,8 KB
R1-140804.zip	2014/02/01 11:09	33,1 KB
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R1-140808.zip	2014/02/01 11:09	55,8 KB
R1-140809.zip	2014/02/01 11:09	51,4 KB
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R1-140815.zip	2014/02/01 11:09	33 KB
R1-140816.zip	2014/02/01 11:09	19 KB
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R1-140818.zip	2014/02/01 11:09	21 KB
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sort by name/desc	sort by date/desc	sort by size/desc
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R1-140838.zip	2014/02/07 16:29	33,9 KB
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R1-140840.zip	2014/02/07 9:22	304,4 KB
R1-140841.zip	2014/02/17 9:46	146 KB
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R1-140843.zip	2014/02/17 9:47	8249,7 KB
R1-140845.zip	2014/02/17 9:45	35,5 KB
R1-140846.zip	2014/02/17 9:45	15,4 KB
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R1-140850.zip	2014/02/17 9:45	321,1 KB
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R1-140858.zip	2014/02/17 9:45	58,6 KB
R1-140859.zip	2014/02/17 9:45	38,6 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-140863.zip	2014/02/17 9:45	40,8 KB
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R1-140865.zip	2014/02/17 9:45	33,4 KB
R1-140866.zip	2014/02/17 9:45	29,3 KB
R1-140867.zip	2014/02/17 9:45	27,3 KB
R1-140868.zip	2014/02/17 9:45	27,9 KB
R1-140869.zip	2014/02/17 9:45	33,1 KB
R1-140870.zip	2014/02/17 9:45	33,1 KB
R1-140871.zip	2014/02/17 9:45	18,2 KB
R1-140872.zip	2014/02/17 9:45	19,3 KB
R1-140873.zip	2014/02/17 9:45	18,6 KB
R1-140874.zip	2014/02/17 9:45	619,3 KB
R1-140875.zip	2014/02/17 9:45	40,3 KB
R1-140876.zip	2014/02/17 9:45	28,6 KB
R1-140877.zip	2014/02/17 9:45	38,8 KB
R1-140878.zip	2014/02/17 9:45	40,3 KB
R1-140879.zip	2014/02/17 9:45	10,8 KB
R1-140880.zip	2014/02/17 9:45	31,5 KB
R1-140881.zip	2014/02/17 9:45	37 KB
R1-140882.zip	2014/02/17 9:45	29,1 KB
R1-140883.zip	2014/02/17 9:45	25,9 KB
R1-140884.zip	2014/02/17 9:45	28,9 KB
R1-140885.zip	2014/02/17 9:45	29,5 KB
R1-140887.zip	2014/02/17 9:45	42,2 KB
R1-140888.zip	2014/02/17 9:45	41,5 KB
R1-140889.zip	2014/02/17 9:45	28,9 KB
R1-140890.zip	2014/02/17 9:45	22,7 KB
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R1-140893.zip	2014/02/17 9:45	439,5 KB
R1-140894.zip	2014/02/17 9:44	58,6 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-140899.zip	2014/02/17 9:44	33,1 KB
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R1-140901.zip	2014/02/17 9:44	14,9 KB
R1-140902.zip	2014/02/17 9:44	14,9 KB
R1-140903.zip	2014/02/17 9:44	15 KB
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R1-140907.zip	2014/02/17 9:44	96,9 KB
R1-140908.zip	2014/02/19 9:04	21 KB
R1-140909.zip	2014/02/28 14:18	3739,5 KB
R1-140910.zip	2014/02/28 14:18	18,4 KB
R1-140911.zip	2014/02/28 14:18	18,7 KB
R1-140930.zip	2014/02/17 9:44	30,2 KB
R1-140931.zip	2014/02/17 9:44	27 KB
R1-140932.zip	2014/02/17 9:44	140,5 KB
R1-140933.zip	2014/02/17 9:44	313 KB
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R1-140937.zip	2014/02/17 9:44	27,6 KB
R1-140938.zip	2014/02/17 9:44	27,8 KB
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R1-140942.zip	2014/02/17 9:44	9,6 KB
R1-140943.zip	2014/02/17 9:44	13,5 KB
R1-140944.zip	2014/02/20 15:50	389,2 KB
R1-140945.zip	2014/02/27 12:37	35,9 KB
R1-140946.zip	2014/02/17 9:44	520,7 KB

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R1-140957.zip	2014/02/17 9:44	63,5 KB
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R1-140961.zip	2014/02/17 9:43	281,5 KB
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R1-141056.zip	2014/02/27 12:37	136,4 KB
R1-141057.zip	2014/02/21 11:08	1340,8 KB
R1-141058.zip	2014/02/27 12:37	23,5 KB
R1-141059.zip	2014/02/27 12:37	23,6 KB
R1-141060.zip	2014/02/28 16:28	45,6 KB
R1-141061.zip	2014/03/13 20:46	509,9 KB
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R1-141066.zip	2014/03/24 8:09	48,7 KB
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TDoc_List_Meeting_RAN1#76.xlsx	2017/11/07 11:32	210,8 KB
TDoc_List_Meeting_RAN1#76.zip	2018/01/10 16:44	271,7 KB

1023 items.

Appendix 29

3GPP TSG RAN WG1 Meeting #76bis **R1-141730**
Shenzhen, China, 31st March – 04th April 2014

Source:	**MCC Support**
Title:	**Final Report of 3GPP TSG RAN WG1 #76 v1.0.0 (Prague, Czech Rep., 10th – 14th February 2014)**
Document for:	**Approval**



1

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Main facts summary

3GPP TSG WG RAN1 #76 meeting, hosted by the European Friends of 3GPP took place at the CLARION CONGRESS HOTEL in PRAGUE.
The meeting started at 9:00 on Monday 10th February and finished at 17:05 on Friday 14th February 2014.
The number of attending delegates, having signed the participants' paper list, was **270**.

The week was scheduled as follows:

- Monday: Common session on Agenda items 1, 2, 3, 4, 5, 7.1 (E-UTRA maintenance Releases up to 11) followed by LTE D2D Proximity Services (AI 7.2.8).

- Tuesday (LTE): Parallel sessions on
  - LTE TDD-FDD Joint Operation (AI 7.2.3), Physical layer functionalities required for operation of Dual Connectivity (AI 7.2.5), Small Cell Enhancements (AI 7.2.4) and LTE D2D Proximity Services (AI 7.2.8) chaired by Satoshi Nagata on one hand.
  - Low Cost & Enhanced Coverage MTC UE for LTE (AI 7.2.2) chaired by Wanshi Chen, followed by Inter-eNB CoMP for LTE (AI 7.2.6) chaired by Matthew Baker, followed by Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation (AI 7.2.1) chaired by Wanshi Chen on the other hand.
- Tuesday (HSPA): Maintenance of UTRA Releases 4 – 11 (AI 5.1), followed by Further EUL Enhancements (AI 6.4) chaired by Karri Ranta-aho from NSN and UMTS Heterogeneous Networks (AI 6.3) chaired by Carmela Cozzo from Huawei.

- Wednesday (LTE): Parallel sessions on
  - LTE D2D Proximity Services (AI 7.2.8) chaired by Matthew Baker followed by Small Cell Enhancements (AI 7.2.4) and chaired by Satoshi Nagata on one hand.
  - One hour session focused on new UE category folloed by Study on NAICS (AI 7.2.9) chaired by Satoshi Nagata followed by Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation (AI 7.2.1) chaired by Wanshi Chen on the other hand.
- Wednesday (HSPA): Continued on UMTS Heterogeneous Networks (AI 6.3) chaired by Carmela Cozzo from Huawei followed by Study on Scalable UMTS by Filtering (AI 6.6) chaired by Matthew Baker.

- Thursday (LTE): Parallel sessions on
  - Small Cell Enhancements (AI 7.2.4), LTE TDD-FDD Joint Operation (AI 7.2.3), Physical layer functionalities required for operation of Dual Connectivity (AI 7.2.5), and Small Cell Enhancements (AI 7.2.4) chaired by Satoshi Nagata on one hand.
  - Study on 3D-channel model for Elevation Beamforming and FD-MIMO (AI 7.2.7), Low Cost & Enhanced Coverage MTC UE for LTE (AI 7.2.2) chaired by Wanshi Chen, followed by LTE Device to Device Proximity Services (AI 7.2.8), Inter-eNB CoMP for LTE (AI 7.2.6) chaired by Matthew Baker, followed by Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation (AI 7.2.1) chaired by Wanshi Chen on the other hand.
- Thursday (HSPA): DCH Enhancements (AI 6.2) chaired by Karri Ranta-aho from NSN, followed by Enhanced Broadcast of System Information (AI 6.5) chaired by Carmela Cozzo from Huawei and continued on Scalable UMTS by Filtering (AI 6.6) chaired by Matthew Baker.

- Friday morning: Parallel sessions on
  - LTE TDD-FDD Joint Operation (AI 7.2.3) and LTE D2D Proximity Services (AI 7.2.8) chaired by Satoshi Nagata on one hand.
  - Scalable UMTS by Filtering (AI 6.6) chaired by Matthew Baker, followed by Low Cost & Enhanced Coverage MTC UE for LTE (AI 7.2.2) and Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation (AI 7.2.1) chaired by Wanshi Chen on the other hand.
- Friday afternoon: Revisions

Before closing the meeting, 3GPP Excellence Awards granted to Robert Love from Motorola Mobility.

The list of action points that required RAN1 close follow-up is listed in Annex F (end of document).

The number of contribution documents for this meeting was **1020**, and those documents were categorized as followed.

Agenda Item	Input Document	Discussed Document
AI 5 to 7.2.9	1017	409

Note: The amount of documents includes those discussed during the email discussion session post meeting.

1 Opening of the meeting

Mr Satoshi Nagata (RAN1 Chairman) welcomed the participants of the 76th RAN WG1 meeting and opened the meeting at 09:00.
Mr Yuichi Morioka from Sony welcomed the delegates on behalf of the host, the European Friends of 3GPP, Alcatel-Lucent, BlackBerry, Deutsche Telekom, Ericsson, Huawei, Intel, Motorola, Nokia, NSN, Orange, Qualcomm, SIMAlliance, Sony, TeliaSonera, Telefonica, Telecom Italia, Telenor, and Vodafone and detailed the domestic arrangements for the full week.

1.1 Call for IPR

The Chairman drew the attention to Members' obligations under the 3GPP Partner Organizations' IPR policies. Every Individual Member organization is obliged to declare to the Partner Organization or Organizations of which it is a member any IPR owned by the Individual Member or any other organization which is or is likely to become essential to the work of 3GPP.

The attention of the members of this Technical Specification Group is drawn to the fact **that 3GPP Individual Members have the obligation** under the IPR Policies of their respective Organizational Partners to **inform their respective** Organizational Partners **of Essential IPRs they become aware of**.
The members take note that they are hereby invited:
- to investigate in their company whether their company does own IPRs which are, or are likely to become Essential in respect of the work of the Technical Specification Group.
- to notify the Director-General, or the Chairman of their **respective** Organizational Partners, of all potential IPRs that their company may own, by means of the IPR Statement and the Licensing declaration forms (e.g. see the ETSI IPR forms http://webapp.etsi.org/Ipr/).

1.2 Network usage conditions

The PCG has laid down the following network usage conditions:

Users shall not use the network to engage in illegal activities. This includes activities such as copyright violation, hacking, espionage or any other activity that may be prohibited by local laws.

Users shall not engage in non-work related activities that consume excessive bandwidth or cause significant degradation of the performance of the network.
Since the **network is a shared resource**, users should exercise some basic etiquette when using the 3GPP network at a meeting. It is understood that high bandwidth applications such as downloading large files or video streaming might be required for business purposes, but delegates should be strongly discouraged in performing these activities for personal use. Downloading a movie or doing something in an interactive environment for personal use essentially wastes bandwidth that others need to make the meeting effective. The meeting chairman should remind end users that the network is a shared resource; the more one user grabs, the less there is for another. Email and its attachments already take up significant bandwidth (certain email programs are not very bandwidth efficient). In case of need the chair can ask the delegates to restrict IT usage to things that are essential for the meeting itself.

1. DON'T place your WiFi device in ad-hoc mode
2. DON'T set up a personal hotspot in the meeting room
3. DO try 802.11a if your WiFi device supports it
4. DON'T manually allocate an IP address
5. DON'T be a bandwidth hog by streaming video, playing online games, or downloading huge files
6. DON'T use packet probing software which clogs the local network (e.g., packet sniffers or port scanners)

2 Approval of Agenda

R1-140000	Draft Agenda for RAN1#76 meeting	RAN1 Chairman	

Satoshi Nagata (Chairman) proposed the agenda for the meeting, as well the schedule of the week.
Decision: The agenda is approved.

3 Approval of Minutes from previous meeting

R1-140001	Final Report of RAN1#75 meeting	MCC	

The document was presented by Patrick Mérias (ETSI Mobile Competence Center) and provides the outcomes of last meeting in San Francisco.
Discussion: MCC reported the recent common practice to provide a copy of meeting document area from the local meeting server to the public server, in folder http://www.3gpp.org/ftp/Meetings_3GPP_SYNC/
Decision: The agenda is approved.

4 Highlights from RAN Plenary

R1-140002	Highlights from RAN#62	RAN1 Chairman	

The document was presented by Satoshi Nagata (Chairman) and provides the outcomes of last plenary meeting relevant to RAN1.
Discussion: MCC commented that TR36.843 on D2D will go for one step approval at next plenary meeting, resulting from the situation that RAN1 missed to present v1.0.0 in December.
Decision: The document is noted.

5 Incoming Liaison Statements

D2D related

R1-140004	LS on text proposal for TR 36.843 on D2D	RAN2, Qualcomm	= R2-134590

The document was presented by Shailesh Patil from Qualcomm and asks RAN1 to incorporate content of R2-134589 into TR 36.843.
Decision: The document is noted. It is agreed to include RAN2 agreements into TR36.843 – rapporteur (Qualcomm)

R1-140008	LS response on D2D Typical UE in-band Emissions	RAN4, Ericsson	= R4-137102

The document was presented by Ms Iana Siomina from Ericsson and recommends, for single cluster transmissions, that RAN1 assess the sensitivity of the D2D performance to the inband emission levels over the following 2 sets of levels for the offset parameters W, X, Y and Z [dB]: {W, X, Y, Z} = {0, 0, 0, 0}, {3, 6, 3, 3}
With respect to multi-cluster inband emissions, RAN4 has not agreed on a typical model.
Discussion: LGE → have we align simulation assumptions according to this LS.
Decision: The document is noted. It shall be treated in D2D session.

R1-140010	Reply to LS on notifying for information of including Annex about Public Safety ProSe Communication in TR 36.843	SA1, Telecom Italia	= S1-135308

The document was presented by Enrico Buracchini from Telecom Italia and reminds that SA1 use cases and related requirements, have been already defined and agreed in TS 22.278 and have to be properly taken into account into stage 2 and stage 3 development.
Decision: The document is noted.

R1-140013	LS on discovery message size	RAN2, Qualcomm	= R2-134591

The document was presented by Shailesh Patil from Qualcomm and informs RAN1 that RAN2 seeks information from SA2 about what is the expected overall size of discovery message, i.e. the expected size of ProSe Identities and size of any other expected fields to be transferred from upper layer. In addition, RAN2 does not intend to discuss latency.
Discussion: No action to RAN1.
CATT: can latency be clarified as RAN2 did not answer the topic?
Decision: The document is noted.

R1-140185	LS reply on discovery message size	SA2, Alcatel Lucent, Intel	= S2-140568

The document was presented by Fang Chen Cheng from ALU and states that SA2 has concluded that for public safety use cases there could be a difference in size with the non-public safety open discovery use case, mainly due to the judgment that some companies voiced that public safety requires fewer classification criteria and reluctance to agree to higher bits allocation.
Additionally, restricted and open discovery may lead to different message sizes also, in Public safety use cases.
Discussion: No need to change message size in RAN1, according to ALU. LGE believes that assumptions need to be reviewed.
Decision: The document is noted.

R1-140186	Reply to LS on discovery message size	SA3, Qualcomm	= S3-140226

The document was presented by Shailesh Patil from Qualcomm and states that SA3 has not yet concluded on the scope and size of the security parameter(s) needed.
Discussion: No action to RAN1.

Decision: The document is noted. The above three contributions shall be further treated in D2D session
Wednesday 12th: Huawei will prepare a draft LS to at least RAN2 for further discussion and to aid the decision on whether an LS might be sent - R1-140942.
Friday 14th: No consensus

R1-140015	Reply LS on ProSe Lawful Interception	RAN, Telecom Italia	= RP-132107

The document was presented by Enrico Buracchini from Telecom Italia and shows RAN's reply asking SA3-LI, SA3 and SA2 to provide a description of the aspects with potential impact to RAN of the solutions being developed which enable lawful interception and data retention, in order to allow RAN to assess the impact over E-UTRAN.
Decision: The document is noted.

R1-140182	Reply LS on ProSe Lawful Interception	SA2, Qualcomm	= S2-140494

The document was presented by Saurabh Tavildar from Qualcomm and informs RAN that SA3-LI is responsible to decide the requirements for Lawful Interception on ProSe.
Discussion: No action to RAN1.
Decision: The document is noted.

R1-140181	Reply LS on D2D proximity criteria	SA1, Telecom Italia	= S1-140319

The document was presented by Enrico Buracchini from Telecom Italia and states that SA1 has identified that only the operator is capable of controlling proximity criteria.
Discussion: Telecom Italia suggested to update the TR with this assumption on proximity criteria.
Decision: The document is noted. Offline discussions to find the wording for inclusion to TR (Telecom Italia, Qualcomm)
Wednesday 12th:

R1-140936	TP on D2D proximity criteria after LS exchange with SA1	Telecom Italia, [Qualcomm]	

Decision: The document is noted and TP is agreed for inclusion in next update of TR36.843

R1-140184	LS on ProSe Out of Coverage discovery	SA2, Deutsche Telekom	= S2-140560

The document was presented by Georg Wannemacher from DT and requests the specification of a solution for ProSe Discovery out of network coverage to be part of Rel-12.
Decision: The document is noted.

R1-140647	Discussion on ProSe out of coverage discovery	Intel Corporation	

The document was presented by Alexei Khoryaev from Intel and proposes that Model B should be studied by RAN WGs. The expected impact on the work in RAN1 and RAN2 is as follows:

- RAN1: Need to define evaluation methodology for Model B discovery.
- RAN2: Definition of protocol functionality for Model-B support.

Given that SA2 has agreed to support both discovery models (Model A and Model B), it is a good approach to consider both models for out of coverage scenario.
Discussion: Huawei → asked clarifying the impact to RAN1.
ALU → specifying Model B is likely not needed – Intel suggested that Model B is not precluded.
Decision: The document is noted.

R1-140728	Draft LS reply on ProSe Out of Coverage discovery	Ericsson	

The document was presented by Ms Iana Siomina from Ericsson and states that, if out of coverage direct discovery is re-prioritized, only one of the two topics (direct discovery or broadcast direct communication) can be completed within the SI before RAN#63.
Discussion: Broadcom → it is up to RAN to prioritize our work.
Decision: The document is noted.
Continue offline/online discussions by exploiting D2D discovery session (Ericsson, Intel)
Wednesday 12th:

R1-140935	[Draft] Reply LS on ProSe Out of Coverage discovery	Ericsson	

"RAN1 asks RAN plenary to reply to SA2 on behalf of RAN1."
Decision: The document is noted. Ericsson to prepare an LS accordingly in R1-140943.
Discuss offline what else would be required to support out-of-coverage discovery.
Thursday 13th

R1-140943	[Draft] Reply LS on ProSe Out of Coverage discovery	Ericsson	(R1-140935)

Modify 943 as follows:

1. Overall Description:
RAN1 kindly asks RAN plenary to reply to SA2 on behalf of RAN1.
2. Actions:

To TSG RAN:
RAN1 kindly asks RAN to respond to SA2.
Decision: The document is noted and final LS is agreed in R1-140950.

R1-140017	LS on parameter synchronization	SA3, Qualcomm	= S3-131152

The document was presented by Saurabh Tavildar from Qualcomm and raises the following questions to RAN1:
- Can it be assumed that all UEs within discovery range of a given UE have alignment – within a known offset if necessary – of a parameter (e.g. time, counter, etc.) whose value changes for all such UEs?
- What are the parameters of this value: e.g. how many bits long it is, how often does it change?
- If the value rolls over, can it be assumed that all UEs can keep track of a second value with similar properties, with which the aforementioned value can be augmented so as to preserve the alignment amongst these UEs.

Decision: The document is noted.

R1-140457	Discussion on LS on parameter synchronization	Qualcomm Inc.	

The document was presented by Saurabh Tavildar from Qualcomm and notes that such system counter, if defined, would provide a common value to all UEs that receive this broadcast message. A draft LS based on the analysis above is provided in [R1-140432].
Decision: The document is noted.

R1-140432	Draft response LS on parameter synchronization	Qualcomm Inc.	

Discussion: ALU better to wait until D2D session.
Decision: The document is noted.
Continue offline/online discussions by exploiting D2D session (Qualcomm)
Wednesday 12th:

R1-140940	Draft response LS on parameter synchronization	Qualcomm Inc.	

Decision: The document is noted and final LS is agreed in R1-140941 with the following changes:
yet to be agreed in RAN1 or RAN2
~~In the case that SIB16 is not sent~~Alternatively,

R1-140005	Reply LS on mobility support for Low Complexity MTC UEs and MTC coverage enhancement	RAN2, Vodafone	= R2-134596

The document was presented by Eric Bouton from Vodafone and states that, since accepting a 1000 bit limit might put restrictions on the extensibility of these SIBs in the future, RAN1 is asked to consider keeping the current limit of 2216 bits for the BCCH TBS size within the work on Low complexity MTC UEs.
Discussion: Vodafone planned some off line discussion on this topic during the day.
Decision: The document is noted. Offline/online discussions to consider the current limit of 2216 bits for the BCCH TBS size within the work on Low cost MTC UEs – (Vodafone)
Friday 14th: See AI 7.2.2.1

Random Access in dual connectivity

R1-140006	LS on Random Access in dual connectivity	RAN2, NEC	= R2-134603

The document was presented by Kevin Lin from NEC and informs that:
- RAN2 intends to support Contention Based Random Access for the Secondary eNB
- RAN2 agreed that the UE receives Msg2 from the eNB to which the preamble was sent.
- With regarding to parallel Random Access procedures, one for Master eNB and the other for Secondary eNB, RAN2 agreed that it is supported if the two preamble transmissions are not overlapping. However RAN2 has not concluded for the other case, i.e. when the two preamble transmissions are overlapping. RAN2 would like to ask RAN1 whether it is feasible to support parallel preamble transmissions, one for Master eNB RACH and the other for Secondary eNB RACH.
- At least one cell in Secondary eNB has configured UL and one of them is configured with PUCCH resources. The cell in the Secondary eNB which is configured with PUCCH resources cannot be cross-carrier scheduled.

RAN1 to answer whether it is feasible to support parallel preamble transmissions, one for MeNB RACH and the other for SeNB RACH.
Decision: The document is noted.

R1-140166	Discussion on parallel PRACH for dual connectivity	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Ms Sigen Ye from ALU and deals with the specification impact of supporting parallel preamble transmission, and it is proposed not to parallel preamble transmissions for dual connectivity.

Discussion: Samsung → better to wait until the online session as there are a number of contributions to be taken into account.
Decision: The document is noted.
Continue offline/online discussions by exploiting Dual Connectivity session
****
Thursday 13th

R1-140294	Discussion on random access in dual connectivity	LG Electronics	

The document was presented by Ms Yunjung Yi from LGE and deals with specification impact to support parallel preamble transmissions. In general, it is supportable to transmit parallel PRACH transmission in non-power limitation cases for dual connectivity. When power limitation case occurs, PRACH on PCell can be prioritized and other PRACH can be dropped. Not to incur performance degradation, some coordination among MeNB and SeNB to avoid successive PRACH collisions and handling of dropped PRACH would be desirable.
Decision: The document is noted.

R1-140295	Draft LS response on random access in dual connectivity	LG Electronics	

R1-140479	Discussion on parallel PRACH preamble transmissions for dual-connectivity	NEC	

The document was presented by Kevin Lin from NEC and draws the following observations:

- Observation 1: It is a very rare case for a UE has to send parallel preambles (one for each eNB) in dual connectivity. Both PRACH configurations will need to have overlapping system frame number, subframe number, and PDCCH orders are sent in the same subframe or UE selected random backoff timing after expiration of RA response window coincide to the same UL subframe(s).
- Observation 2: RAN1 specification effort seems significant in order to support the rare case of parallel preamble transmission. A few different approaches are foreseen and each could have different specification impacts. Further studies are needed if decide to support parallel preamble transmissions in dual connectivity.
- Observation 3: Depending on the option selected to avoid parallel preamble transmission, specification impact may involve different RAN WGs. Overall, in our opinion, the required changes are not significant.

Discussion: .
Decision: The document is noted.

R1-140890	Draft LS response on Random Access in dual connectivity	NEC	

Inform RAN2 of the following agreements.

- It is feasible to support parallel PRACH preamble transmissions in non-power-limited case.
- Only one PRACH preamble transmission is allowed at any point in time in power-limited case.

Decision: The document is noted and final LS is agreed in R1-141007 by adding following points and adding contact person

- *FFS: Whether or not and how UE support parallel PRACH transmission in the power limited case*
- *RAN1 is discussing FFS part*

****

R1-140007	3GPP RAN WG4 input to update submission for IMT-2000 CDMA DS and IMT-2000 CDMA TDD toward Rev. 12 of Rec. ITU-R M.1457 "Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)"	RAN4, Telecom Italia	= R4-137081

Decision: The document is just noted for information.

R1-140009	Reply LS on Synchronization aspects in LTE-TDD networks	RAN4, Huawei, NSN	= R4-137156

The document was presented by Ms Elean Fan from Huawei and shows RAN4's answers to ECC PT1 on the status of currently developing report on synchronization for TDD networks in a multi-operator context.
Discussion: No action to RAN1.
Decision: The document is noted.

On GCSE with eMBMS

R1-140011	Further questions on GCSE with eMBMS	SA2, Vodafone	= S2-134580

The document was presented by Tim Frost from Vodafone and asks RAN1 to provide views on a) the implementation of UEs for Public Safety users that (in conjunction with transmitting and receiving unicast data) can receive multiple MBMS services and/or multiple MBSFN areas at the same time, and b) the relative power consumption of the UE in different cases listed in the LS.
Decision: The document is noted.

R1-140016	Response to LS on Further questions on GCSE with eMBMS	RAN, Vodafone	= RP-132109

The document was presented by Tim Frost from Vodafone and provides RAN feedback to SA2 GCSE work.
Discussion: No action to RAN1.
Decision: The document is noted.

R1-140014	Response LS on GCSE with eMBMS	RAN2, Alcatel Lucent	= R2-134594

The document was presented by Matthew Baker from ALU and provides RAN2 feedback to SA2 GCSE work.
Discussion: No action to RAN1.
Decision: The document is noted.

R1-140003	Reply LS on the UE capabilities regarding support of simultaneous MBMS bearer reception	RAN2, Samsung	= R2-134486

The document was presented by Youngbum Kim from Samsung and informs SA4 that an MBMS capable UE is only required to support reception of a single MBMS bearer service at a time i.e. reception of more than one MBMS bearer service up to UE implementation.
Discussion: No action to RAN1.
Decision: The document is noted.

R1-140183	Reply LS on the UE capabilities regarding support of simultaneous MBMS bearers	SA2, Samsung	= S2-140511

The document was presented by Youngbum Kim from Samsung and confirms that SA2 does not see any architectural limitations for supporting multiple eMBMS bearers simultaneously, i.e. any restrictions would be due to RAN aspects.
Discussion: No action to RAN1.
Decision: The document is noted.

R1-140012	Reply LS on FDD-TDD switching enhancement in FDD-TDD joint operation	RAN2, CMCC	= R2-134582

The document was presented by Xiaodong Shen from CMCC and informs that in Small Cell Enhancement--higher layer study item, dual-connectivity has been considered as a potential solution to address the user throughput improvement, mobility robustness and signalling load challenges, assuming that the involved cells may operate either in the same duplex scheme (i.e. FDD only or TDD only) or in the different duplex schemes (FDD/TDD) with regard to the deployment scenarios.
If 1 UL, 1 DL (i.e., same as the current dual mode UEs) as mentioned in RAN1 LS is required, it might not be the case that such use case / scenario / UE requirement can be satisfied by the current dual-connectivity solution as being developed. From specification point of view, it is possible for a Rel-8 UE with the support of TDD/FDD handover to perform a handover in tens milliseconds level irrespective of the FDD/TDD modes. The use case/scenario/UE requirement identified by RAN1 can be satisfied by existing handover mechanism. RAN2 thinks that lack of IOT of mandatory Rel-8 functionality should not be used as justification for introducing a new Rel-12 feature.
Decision: The document is noted. Use case / scenario identified in R1-134967 was discussed, and no more RAN1 work is needed in Rel-12 TDD-FDD joint operation WI.

5.1 Incoming LS received during the week

R1-141050	LS on Text Proposal for TR 36.843	RAN3, Qualcomm	= R3-140490
R1-141051	LS on Text Proposal for TR 36.843 on D2D	RAN2, Qualcomm	= R2-141009
R1-141053	Reply LS on Multiple Access Scheme for D2D	RAN4, Qualcomm	= R4-140969
R1-141054	Reply LS on AGC and Frequency Error for D2D	RAN4, Qualcomm, Ericsson	= R4-141241

Above LSs were received after the closing of RAN1#76. As they may affect the content of TR36.843.on D2D, these LSs are included in email discussion [76-19] for approval by RAN1 and if agreed, further inclusion in the next version of the TR.
Decision: Both documents are noted.

6 UTRA

R1-140907	Chairperson's summary of the UMTS sessions	UMTS Session Chairpersons (NSN, Huawei, Alcatel-Lucent)	

The document was presented by the different chairpersons and reports the outcomes of the relevant HSPA sessions.
Decision: The document is endorsed and incorporated below, including the following updates.

6.1 Maintenance of UTRA Releases 4 – 11

6.1.1 FDD

R1-140835	25.212 CR0322 (Rel-7, F) Correction to HS-SCCH special information mapping for HS-SCCH less HSDPA	NSN	

Reason for change:	The Second or third transmission bit is defined to be Xsec,3 in section 4.6A.2.2.1, but the polarity of the bit is undefined. However, section 4.6A.2.2.1.3 "Second or third transmission mapping" defines the polarity for Xsec,1. The definitions Xsec,1 and Xsec,3 are not used elsewhere and it is evident that section 4.6A.2.2.1 should use the Xsec,1 defined in 4.6A.2.2.1.3
Summary of change:	Changing Xsec,3 to Xsec,1 in section 4.6A.2.2.1
Consequences if not approved:	The special information mapping definition uses a bit of undefined polarity.

Decision: The document is noted and CR is agreed together with the correspondent shadow CRs to Rel-8 through Rel-11.

R1-140900	25.212 CR0323 (Rel-8, A) Correction to HS-SCCH special information mapping for HS-SCCH less HSDPA	NSN	
R1-140901	25.212 CR0324 (Rel-9, A) Correction to HS-SCCH special information mapping for HS-SCCH less HSDPA	NSN	
R1-140902	25.212 CR0325 (Rel-10, A) Correction to HS-SCCH special information mapping for HS-SCCH less HSDPA	NSN	
R1-140903	25.212 CR0326 (Rel-11, A) Correction to HS-SCCH special information mapping for HS-SCCH less HSDPA	NSN	

R1-140678	25.214 CR0711 (Rel-10, F) Clarification on (de-)activation status of secondary carriers when higher layer indicates a change of HS-DSCH cells	Huawei, HiSilicon	

Reason for change:	Upon RRC reconfiguration indicates a change of Secondary_Cell_Enabled from a value not equal to 0 to a value not equal to 0 and does not indicate a change of the serving HS-DSCH cell, the initial activation and deactivation status of a configured secondary serving HS-DSCH cell is not specified if it is not configured as a secondary serving HS-DSCH cell prior to RRC reconfiguration.
Summary of change:	The following behavior is specified: Upon RRC reconfiguration indicates a change of Secondary Cell Enabled from a value not equal to 0 to a value not equal to 0 and does not indicate a change of the serving HS-DSCH cell, a configured secondary serving HS-DSCH cell shall be activated if it is not configured as a secondary serving HS-DSCH cell prior to RRC reconfiguration.
Consequences if not approved:	The UE behavior and network behavior are not clear. There might be misunderstanding on the initial activation and deactivation status of a configured secondary serving HS-DSCH cell between UE and NodeB.

Decision: The document is noted.

R1-140679	25.214 CR0712 (Rel-11, A) Clarification on (de-)activation status of secondary carriers when higher layer indicates a change of HS-DSCH cells	Huawei, HiSilicon	

Conclusion: RAN1 agrees that the initial activation status of a secondary HS-DSCH cell is always active. RAN1 will attempt to complete the 25.214 text by email reviewing the CRs to 25.214 with the understanding that RAN2 is also discussing the topic, and that RAN2 conclusions may render RAN1 CRs obsolete.
Email review until Friday, 21st of February – (Huawei)

6.1.2 TDD

< No Contributions >

6.2 DCH Enhancements

WID in RP-131357. The enhancements are intended to target AMR voice over DCH, and/or SRB over DCH (where applicable.)

6.2.1 DL transport channel processing and multiplexing

R1-140250	Design of DL Transport Channel Processing and Multiplexing	MediaTek Inc.	

- **Proposal:** Agree the proposed downlink encoding chain "interleave-repeat" method shall be adopted to be standardized for DCH enhancements.

Decision: The document is noted.

R1-140251	DL DCH Enhancement Solution Performance Comparison	MediaTek Inc.	

- **Observation 1:** It reduces DL link gain around 0.6dB in order to transmit DL AI for UL FET.

Decision: The document is noted.

R1-140700	Analysis of Downlink Rate-Matching and Interleaving Enhancements	Qualcomm Incorporated	

Proposal 1: For voice over downlink DCH Enhancements, the R99 rate-matching shall be used, except that the RM attributes of the transport channel carrying DCCH shall be treated as zero whenever that transport channel does not deliver a DCCH block (i.e., pseudo-flexible rate-matching).

Decision: The document is noted.

From RAN1#75 chairman's notes:

For downlink:

- ***Option 1:*** *Concatenate DTCH and DCCH and process both as a single block, rate match by truncating or repeating bits*
- ***Option 2:*** *Process DTCH and DCCH separately, when DCCH is absent consider its rate matching attribute to be zero and rate match DTCH to fill all the bits on DPCH*

Final decision to be taken in RAN1#76.

Option 1 refers to inter-leave and repeat as proposed in 0250.
Option 2 refers to pseudo rate-matching as proposed in 0700.

- As agreed in RAN1#74bis, Option 1 0.1 dB in link efficiency gain, and an average decoding time gain up to 1 slot over option 2.
- Option 2 preserves the Rel'99 TrCH processing below CRC attachment, whereas option 1 requires modification on rate matching.

Conclusion: The RAN1 HSPA ad-hoc session in RAN1#76 was not able to reach consensus on which of the two options to select.

Friday 14th

R1-141040	Way Forward on Aspects of DCH Enhancements	Qualcomm, MediaTek, Huawei, HiSilicon, ZTE, Mstar, ITRI	

The document was presented by Arjun Bharadwaj from Qualcomm.

- DL DCH design
  - **Option 2**, referred to as "pseudo rate-matching" as proposed in R1-140700, is adopted for DCH Enhancements Work Item.

Decision: The document is noted and above DL DCH design is agreed.

6.2.2 DL control channel design

6.2.2.1 DL DPCCH slot format optimization

< No Contributions >

6.2.2.2 DL ACK indication for UL frame early termination

R1-140701	Performance of DL ACK signalling Mechanisms for UL FET	Qualcomm Incorporated	

Proposal: Study design of Ack channel sent on DL supporting UL FET to improve its performance in soft handover.

Decision: The document is noted.

6.2.3 UL transport channel processing and multiplexing

R1-140252	Uplink Design for DCH Enhancements	MediaTek Inc.	

Proposal 1: UL speech frame compression method (UL FET-Less design) shall be adopted to be standardized for DCH enhancements.
Decision: The document is noted.

R1-140254	System Performance Comparison of DCH Enhancement Solutions	MediaTek Inc.	

Decision: The document is noted.

R1-140702	Comparison of UL DCH channel without FET and with reduced FET opportunity	Qualcomm Incorporated	

In the no FET scenario:
- UL decides on using 10ms TTI or 20ms TTI prior to transmission of new TTI based on a threshold on UPH (UE power headroom).
- UE signals choice of TTI to NodeB via TFCI information.

Decision: The document is noted.

Working assumption:
- Adopt the UL FET-less operation, where UE transmits the voice frame over one or two radio frames
  - The switch between 10 and 20 ms transmission could be e.g. based on UE power headroom
  - DL FET-ACK is not needed
  - The 20 ms transmission interleaves the TB over the full 20 ms TTI according to Rel'99 design

Consider further:
- In addition to the UL FET-less operation, consider a mode where the FET is used for the uplink
  - It may be possible to configure the UE to monitor FET-ACK in DL in limited number of DL slots in order to reduce the impact of false-ACK
  - DL FET-ACK channel design is FFS

R1-140253	Uplink Compressed Mode Considerations	MediaTek Inc.	

Decision: The document is noted.

Observation: Enhanced DCH can be designed to work with compressed mode. Detailed solutions invited for RAN1#76bis.

6.2.4 UL control channel design

6.2.4.1 UL DPCCH slot format optimization

< No Contributions >

6.2.4.2 UL ACK indication for DL frame early termination

R1-140252	Uplink Design for DCH Enhancements	MediaTek Inc.	

Proposal 2: UL ACK indication design (M-DPCCH-S0) shall be adopted to be standardized for enhanced DCH
Decision: The document is noted.

R1-140703	UL ACK and TFCI signalling for DL FET	Qualcomm Incorporated	

Proposal: TDM ACK and early TFCI carried over UL DPCCH are adopted for signalling ACK for DL FET.
Decision: The document is noted.

R1-140783	Further Consideration on Uplink ACK Channel Design for DL FET	ZTE	

- Option 1: A new UL control channel, FET-DPCCH, is proposed, which reuses the structure of HS-DPCCH channel. During the first two slots of DTCH TTI the TFCI information is transmitted. Subsequent slots after TFCI is sent are dedicated to transmission of the FET ACK signal.
- Option 2: The UL DPCCH is slightly modified. In the first 7 slots (as an example) within a 20ms TTI the TFCI information is transmitted. The FET ACK indication is transmitted in the remaining slots after TFCI is sent.

- Option 3: In case of 750Hz TPC rate, the spared TPC symbols are used to transmit the FET ACK indication (ETI). In this example, the ETI can be sent every two slots in UL DPCCH from slot 1 to slot 29.
- **Proposal 1:** Further evaluate the design option 1 and option 2 as potential candidates for FET ACK indication design for DL FET.

Decision: The document is noted.

Agreement: The UL DPCCH-based structure for uplink control design is to be adopted, where
- In the first slots the DPCCH consists of pilot, TPC and TFCI
- In the remaining slots the TFCI bits are replaced with BPSK-encoded ACK/NACK-symbols

Possible agreements
- Npilot = 5 or 6
- Ntfci/Nack/nack = 3 or 2
- Ntpc = 2

Open issues
- The split of symbols between pilots and TFCI/ACK/NACK
- Whether a power boost is allowed for ACK-symbols
- Whether to repeat the FET-ACK bits in several slots for soft combining

Friday 14th

R1-141040	Way Forward on Aspects of DCH Enhancements	Qualcomm, MediaTek, Huawei, HiSilicon, ZTE, Mstar, ITRI	

The document was presented by Arjun Bharadwaj from Qualcomm.
- The following design of UL DPCCH channel for UL ACK indication is adopted for DCH enhancements work item:
  - Slot format for UL DPCCH contains as proposed in R1-140252:
    - Npilot=6,
    - Ntfci/NACK/ACK=2
    - Ntpc=2
  - TFCI is sent in the first 10 slots as proposed in R1-140252.
  - ACK/NACK is sent by boosting and/or repetition of ACK symbols

Decision: The document is noted and the above UL DPCCH design is agreed.

6.2.5 Other

R1-140255	System Performance Degradation due to Abnormal TPC	MediaTek Inc.	

Proposal 1: For practical system evaluation, the performance degradation due to abnormal TPC should be taken into account.

Decision: The document is noted.

R1-140705	Evaluation of ILPC impact due to erroneous FET and ACK decoding errors in UL	Qualcomm Incorporated	

Decision: The document is noted.

R1-140704	OLPC algorithms to guarantee multiple target BLERs	Qualcomm Incorporated	

Observation: The final BLER of 1% after 20ms can be ensured by using a less aggressive BLER target setting at 10ms point. If a more aggressive BLER target setting is desired, then the second OLPC loop is beneficial to guarantee that 1% BLER after 20ms is not exceeded.

Decision: The document is noted.

6.3 UMTS Heterogeneous Networks Enhancements

WID in RP-132074,

6.3.1 Reliability of HS-DPCCH and other uplink channels

R1-140140	Consideration of SHO operation in HetNet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Proposal 1: Consider increasing the range of β_{hs} values.
Proposal 2: Allow the macro cell to indicate to the UE whether ILPC of a LPN should be ignored.
Proposal 3: Consider implementing a two pilot for ILPC where:

- *DPCCH is the primary pilot that is power controlled only by the macro where the power of the HS-DPCCH is based on*
- *E-DPCCH act as a virtual secondary pilot that is power controlled by the macro and LPN where the powers of the E-DPDCHs are based on.*

Decision: The document is noted.

R1-140680	On HS-DPCCH reliability and solutions	Huawei, HiSilicon	

Proposal 1: Consider SIR target manipulation as the baseline performance for solving the HS-DPCCH issue.
Proposal 2: Consider dynamic power adjustment of control and data channels to enhance the performance of SIR target manipulation.
Decision: The document is noted.

R1-140681	Dynamic power adjustments of control and data channels	Huawei, HiSilicon	

Proposal 1: Discuss the dynamic power adjustment method which re-interprets the legacy TPC commands.
Decision: The document is noted.

R1-140706	Solutions for UL/DL Imbalance	Qualcomm Incorporated	

Proposal 1: Only solutions that require changes to the specifications are discussed in RAN1.
Proposal 2: The schemes to be considered for HS-DPCCH reliability are:
- *SIR Manipulation*
- *Disabling LPN Power Control*
- *Introduction of a Secondary Pilot*

Decision: The document is noted.

Conclusion on HS-DPCCH:
Solutions considered so far:
1. Virtual secondary pilot (R1-140140 proposal 3)
2. Dynamic rate and power adjustment (R1-140681)
3. Dynamic SIR manipulation (R1-140706, 1st solution)
4. Secondary pilot (R1-140706)
5. Dynamic LPN ILPC restriction (R1-140706, 2nd solution)

Framework for evaluation (link level) is provided in the TR25.800, Section7.1.4.1.
Metrics to evaluate:
1. ACK/NACK misdetection (HS-DPCCH); Happy Bit reliability (E-DPCCH)
2. Uplink interference at the LPN
3. UE Tx power
4. Macro F-DPCH power consumption
5. Impact to specification

6.3.2 Mitigating interference from not SHO UEs

R1-140682	Mitigating uplink interference from non-SHO UEs	Huawei, HiSilicon	

Proposal 1: Use the extended active set operation to identify the non-SHO UE and victim cell without setting up a radio link between them.
Decision: The document is noted.

6.3.3 E-DCH decoupling

R1-140142	E-DCH operation in HetNet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Proposal 1: E-DCH decoupling should be based on uplink measurements at the LPN rather than downlink measurement such as Event 1A.
Proposal 2: Introduce HS-SCCH order(s) to activate/deactivate E-DCH decoupling.
Decision: The document is noted.

R1-140683	Discussion on E-DCH decoupling	Huawei, HiSilicon	

Proposal 1: To adopt the E-DCH decoupling solution to solve the SI reception problem in HetNet deployment.
Proposal 2: To discuss the methods of initiating the E-DCH decoupling operation.
Decision: The document is noted.

R1-140786	E-DCH decoupling in HetNet	NSN	

Proposal 1: Consider presented specification impact analysis for introducing E-DCH decoupling.
Decision: The document is noted.

R1-140787	Bursty Traffic SLS Results for E-DCH Decoupling	NSN	

Proposal: Consider E-DCH decoupling as a basic method for solving SI reception issues.
Decision: The document is noted.

Conclusion on EDCH decoupling:
To adopt the E-DCH decoupling solution
Triggering:
RAN1 method – HS-SCCH order
RAN2 methods (refer to TR25.800)

R1-140905	Decoupling of E-DCH and HS-DSCH serving cell in UMTS HetNet	RAN1, NSN	

Decision: The document is noted and LS is agreed.

6.3.4 Network assisted interference cancellation

R1-140806	Way-Forward on Network Assisted Interference Cancellation	Ericsson, Qualcomm Incorporated	

Proposal 1: A NAIC solution needs to demonstrate no degradation to the average throughput of Macro legacy UEs as well as improved average throughput of a beneficiary LPN UE.
Proposal 2: Discuss and agree on one UE receiver baseline for assessing NAIC performance gains.
Proposal 3: Merits and solutions for signalling assistance information need to be studied further.
Proposal 4: Study whether the CQI outer-loop, often used to improve the robustness of link adaptation, may be used to reflect NAIC benefits.
Decision: The document is noted.

Conclusion:
Aspects to be addressed for NAIC to assess any potential benefits
System simulations for pre- and post-decoding IC
Evaluate impact on Macro legacy users
Evaluate and possibly address impact of CQI mismatch
Evaluate impact of signalling of NAIC
Evaluate complexity impact of implementing NAIC at UE and Network
Impact on specifications across all the WGs

6.3.4.1 NAIC UE reference architecture

R1-140708	Methodology for NAIC System Simulations	Qualcomm Incorporated	

Proposal: The methodology described in this contribution is adopted to conduct system level simulation to evaluate the gains of NAIC.
Decision: The document is noted.

Conclusion:
The methodology in R1-140708 is accepted for system evaluation of NAIC. As baseline, the tables are accepted for the evaluation of post-decoding NAIC.

R1-140684	CQI mismatch with NAIC in Hetnet	Huawei, HiSilicon	

Proposal 1: The CQI mismatch issue needs to be resolved to improve the IC performance of LPN cell edge UEs.
Proposal 2: Resolve or mitigate the CQI mismatch issue while introducing NAIC operation.
Proposal 3: Consider RRS pattern based coordinated scheduling as a solution to mitigate the CQI mismatch in HSPA networks.
Decision: The document is noted.

6.3.4.2 Signalling to enable NAIC and impact to cell capacity

R1-140685	RRS pattern based coordinated scheduling for legacy IC UEs	Huawei, HiSilicon	

Proposal 1: Introduce Iub signalling to indicate the RRS pattern to Macro and LPNs.
Decision: The document is noted.

R1-140686	RRS pattern based coordinated scheduling for new IC UEs	Huawei, HiSilicon	

Proposal 1: Consider enhancements for more accurate CQI estimation and flexible transport format requirement on RRS subframes for new IC UE.
Decision: The document is noted.

6.3.5 Other

R1-140141	Draft LS on signalling impact on CRE operation in UMTS HetNet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted.

R1-140143	Considerations on Cell Range Expansion	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Observation 1: Decentralised CIO adaptation requires:
- *Signalling between LPN/macro cell and the RNC to update the adaptation metrics*
- *Signalling between network and UEs to update CIO value*

Observation 2: The range of CIO values that a UE can tolerate in the CRE region depends on the UE receiver capability.
Observation 3: It is beneficial that the LPN is able to reject and/or recommend another CIO value to the RNC when a UE is considered for handover to the LPN.

Proposal 1: Send an LS to RAN2 and RAN2 to inform them on the 3 observations discussed in this contribution.
Decision: The document is noted.

R1-140709	Introduction of DF-DC as a Multiflow Configuration	Qualcomm Incorporated	

Proposal: The configuration of a serving and assisting secondary serving HS-DSCH cell in multiflow is to be taken into account in the RAN1 specifications.
Decision: The document is noted.

Conclusion: There was disagreement if DF-DC should be specified. RAN is asked to clarify this aspect and WID will be revised accordingly. This will be captured in the Status Report.

R1-140788	NCL parameters for link imbalance calculation	NSN	

Proposal 1: Consider a separate measurement type/event for link imbalance.
Proposal 2: Consider, optionally, sending network specific parameters UL_{RCF} and $LPN_{desense}$ to the UE so as to synchronize the calculation at the UE.
Decision: The document is noted.

Conclusion: RAN2 is discussing this topic, and based on the outcome of RAN2 discussion, RAN1 would consider further discussion.

6.4 Further EUL Enhancements

WID in RP-132078.

R1-140710	E-DPCCH orders for TTI Switching	Qualcomm Incorporated	

Proposal 1: Consider E-DPCCH orders for UE based indication of TTI switching.
Proposal 2: E-DPCCH orders are transmitted 5 times in a repeated fashion to ensure reliability.
Decision: The document is noted.

Conclusion: RAN1 sees that using E-DPCCH to indicate the switch in TTI length to the non-serving cells during SHO appears possible to achieve a certain target reliability (as usual, L1 indications are never 100% reliable). When moving from 2ms TTI to 10ms TTI it is possible to use reserved E-TFCIs to convey the message. When moving from 10ms to 2ms TTI no such reserved E-TFCIs exist, and thus one may need to be borrowed from the 10ms TTI E-TFCI tables.

Draft LS to RAN2 on email review until 28th of February, Arjun

R1-140904	LS to RAN2 E-DPCCH orders to indicate TTI switching	Qualcomm	

6.4.1 Enabling high user bitrates in a mixed-traffic scenario

6.4.1.1 DTX/DRX enhancements

R1-140687	Design for DTX/DRX enhancements	Huawei, HiSilicon	

Proposal 1: The DTX parameters of the secondary carrier are independent of the DTX parameters of the primary carrier in support of DTX/DRX enhancements.
Proposal 2: The DTX cycles of the secondary carrier should be set as an integer multiple of DTX cycles of the primary carrier in support of DTX/DRX enhancements.
Decision: The document is noted.

R1-140790	DTX/DRX enhancements for further improved EUL	NSN	

Proposal: If the HS-SCCH order based secondary carrier activation/deactivation is considered insufficient, consider extending the uplink DTX operation with DC-HSUPA so that stand-alone DPCCH bursts may be eliminated from the secondary carrier, e.g. when the secondary carrier is scheduled a zero grant over E-AGCH.
Decision: The document is noted.

R1-140807	On Decoupling the DRX/DTX Parameters for Secondary Carriers	Ericsson	

Proposal 1: Introduce the value of "Infinity" to the UE S-DTX cycle 2 of the secondary carriers.
Proposal 2: Introduce an UE S-DRX cycle 2 along with an Inactivity Threshold for UE S-DRX cycle2.
Decision: The document is noted.

R1-140837	DTX/DRX improvements for higher rates and battery savings	Qualcomm Incorporated	

Proposal 1: Introduce longer values for DTX cycle 2 for single and multi-carrier EUL operation
Proposal 2: Allow independent DTX parameter values to be signalled for the primary and secondary uplink carrier in DC-HSUPA
Proposal 3: Discuss the merits of the scheme presented for timer based de-activation of secondary band carrier in Dual-Band HSDPA operation
Decision: The document is noted.

R1-140808	On Increasing the DRX Cycle for Single and Primary Carriers	Ericsson	

Proposal 1: Introduce an UE DRX cycle 2 along with an Inactivity Threshold for UE DRX cycle2.
Decision: The document is noted.

Conclusions on uplink DTX

- Allow for configuring different DTX cycle lengths for the two carriers
- Allow for configuring different inactivity threshold for DTX cycle 2 for the two carriers
- Consider further extending the possible DTX cycle 2 durations for the secondary carrier, possibly also including 'infinity'.
  - The possibility to waive Synch procedure AA after a long gap associated with infinitely long DTX cycle should be addressed (Synch procedure AA is used with DC-HSUPA when the secondary carrier is activated with an order)
  - The possibility to transmit DPCCH only together with E-DPCCH/E-DPDCH on the secondary carrier could be considered further as an alternative to infinitely long DTX cycle 2.

Downlink DRX options to be considered further

1. Timer-based deactivation of secondary band carrier(s) in Dual-Band HSDPA operation enabling the UE to turn off the secondary band receiver for battery saving
2. A UE DRX cycle 2 along with an Inactivity Threshold for UE DRX cycle2 for single (as well as multi) carrier operation for better battery saving from longer DRX opportunity
   - The maximum DRX cycle length may be limited by the latency implied to SRB
   - The battery saving benefit from the longer DRX cycle is limited by the network inactivity timer for moving the UE out of Cell_DCH

6.4.1.2 Improved granting

R1-140789	On improved grant handling for TDM operation	NSN	

Proposal: Streamline the further work to the subset of proposed approaches: New E-AGCH Timing for Deactivation and Grant Detection

Decision: The document is noted.

R1-140688	Improved granting for TDM operation	Huawei, HiSilicon	

Proposal: Improved granting for TDM operation is supported by means of allowing UE to monitor more than one E-AGCHs and R12 UE applies the E-AGCH for deactivation one TTI earlier than legacy.
Decision: The document is noted.

R1-140809	On Improving the TDM Operation for Enabling High User Bitrates	Ericsson	

Proposal 1: To improve the TDM operation by using a Time Limited Grant scheme that reuses the L1 structure of the E-AGCH.
Decision: The document is noted.

The improved grant handling for TDM operation to be considered further with the aim to decide on the concept for specification in RAN1#76bis

R1-140791	Fixing Gain Factors for Improved Granting	NSN	

Decision: The document is noted.

6.4.1.3 Improved power control

R1-140711	Impact of Power Control on Longer DTX/DRX Cycles	Qualcomm Incorporated	

Decision: The document is noted.

R1-140810	On Improving the Power Control after Long DTX on Secondary Uplink Carrier	Ericsson	

Proposal 1: To propose solutions to a power control issue that becomes more relevant when dealing with long data interruptions, but that also holds for the current standardized solution in CPC.
Decision: The document is noted.

Conclusion: Further investigation is encouraged on whether the worse stability of the first E-DCH TTI after a DPCCH transmission gap can be mitigated.

6.4.2 HS-DPCCH overhead reduction

R1-140689	Adaptive CQI cycle solution for HS-DPCCH overhead reduction	Huawei, HiSilicon	

Proposal1: CQI cycle adaptive solution is adopted for HS-DPCCH overhead reduction.
Proposal2: HS-SCCH order is used to switch UE from a large CQI reporting cycle to a small CQI reporting cycle.
Decision: The document is noted.

R1-140792	Analysis of Potential Gains for Optimization of HS-DPCCH CQI Reporting Period	NSN	

Proposal: Do not consider adaptive HS-DPCCH reporting period optimization as a means for HS-DPCCH overhead reduction.
Decision: The document is noted.

R1-140690	DTX HS-DPCCH for multi-RAB scenario	Huawei, HiSilicon	

Proposal 1: Agree on HS-DPCCH power reduction in case of power limited multi-RAB scenario.
Proposal 2: CQI/PCI transmit power can be reduced to zero when HS-DPCCH power reduction is applied.
Proposal 3: ACK/NACK transmit power can be reduced to zero or a minimum gain factor configured by higher layers when HS-DPCCH power reduction is applied.
Decision: The document is noted.

R1-140712	HS-DPCCH Overhead Reduction	Qualcomm Incorporated	

Proposal: Consider selective scaling of HS-DPCCH for control channel overhead reduction
Decision: The document is noted.

R1-140811	On a CQI Report Reduction for Multi-RABs with Speech	Ericsson	

Proposal 1: Introduce a UPH threshold, and a CQI_INACTIVITY_TIMER along with a CQI report cycle 2

Decision: The document is noted.

Options to consider for reducing the HS-DPCCH overhead

- **Helping the UL DPDCH coverage in multi-RAB**
  - Scale down CQI gain factor (to zero) before applying equal scaling to DPDCH/DPCCH
    - Always when power limited
    - When power limited and there is no DL activity
  - Increase the CQI feedback cycle (potentially up to infinity) if the UE is power limited and there is no DL activity
  - Scale down ACK/NACK gain factor (to zero or to a minimum value)
    - When power limited
  - Indicate the Node B of the power limitation to allow for the Node B not to schedule HSDPA and thus not incur ACK/NACK overhead (may already be there with UPH, happy bit, etc…)
- **Helping to reduce the HS-DPCCH capacity consumption**
  - Increase the CQI cycle (possibly up to stopping CQI reports)
    - After DL data inactivity
    - If Node B tells the UE to do so with HS-SCCH order

Not treated.

R1-140691	RAN1 Specification impact for the introduction of HS-DPCCH overhead reduction	Huawei, HiSilicon	

6.5 Enhanced Broadcast of System Information

WID in RP-132077.

R1-140793	Initial analysis on design options for a new system information channel	NSN	

Proposal: Consider P/S-CCPCH as a baseline for further discussion on the physical channel design for the secondary BCH channel.

Decision: The document is noted.

R1-140812	BCH Enhancements - RAN1 aspects	Ericsson	

Decision: The document is noted.

Conclusion:
Agreement: The physical channel carrying BCH2 is S-CCPCH. The spreading factor is 256.
Working assumption: TTI length is 10/20ms.
LS to RAN2 (Ericsson): Indicate the above agreement and working assumption.

R1-140906	LS on Enhanced Broadcast of System Information	Ericsson	

Decision: The document is noted and LS is agreed.

To discuss in next meeting: configurability of which code, TBS and number of TB sizes.

6.6 Study on Scalable Bandwidth UMTS by Filtering

SID in RP-132122.

R1-140816	Scalable UMTS Scenarios	Ericsson	

Decision: The document is noted.

6.6.1 Evaluation for standalone scenario

R1-140693	25.701 CR0001 (Rel-12,B) Link level simulation assumptions for filtered S-UMTS	Huawei, HiSilicon	

Decision: The document is noted.

Thomas to discuss offline and prepare a single set of simulation assumptions in R1-140908 for inclusion in the TR, including:

- Modify the scaling of the overhead channels (PCPICH, PCCPCH, PICH and SCH)

- Agreeable modifications uplink simulation assumptions

Conclusion:
- Agree R1-140908 for inclusion in the TR modified as follows:
  - List all the different assumptions that are used in any of the sets of results that are to be included in the TR from R1-140984
  - Add a note that more realistic evaluations would use assumptions that are yet to be identified.
  - Add text in the TR pointing out where the assumptions used for the results that are already in the TR differ from the assumptions in R1-140908 and that they cannot be directly compared with the results that use the assumptions from R1-140908.
  - Also explain that the results for filtered UMTS cannot be directly compared with the results for time dilated UMTS.
  - Call the existing results "preliminary results that motivated further study".

Prepare a TP corresponding to the above conclusion in R1-140986 – Ericsson.
For email approval until Tuesday 25th February.

R1-140695	25.701 CR0003 (Rel-12,B) DL link level simulation results for filtered standalone Scalable UMTS assuming equal overhead power ratio	Huawei, HiSilicon	

Decision: The document is noted. Curves for inclusion in the TR should be limited to 20dB.

R1-140696	25.701 CR0004 (Rel-12,B) DL link level simulation results for filtered standalone Scalable UMTS assuming N times overhead power ratio	Huawei, HiSilicon	

Decision: The document is noted.

R1-140714	Downlink Link Evaluation Results for Filtering in Standalone Scalable UMTS	Qualcomm Incorporated	

Decision: The document is noted.

Possible ways forward:
- Align simulation assumptions (especially for overhead scaling) between filtered and time dilated scalable UMTS, or
- Include results with different overhead scaling assumptions and note in the TR that the results for different scalable UMTS techniques should not be compared with each other.
- Aim to agree a common set of overhead assumptions, e.g.:
  - PCPICH: not scaled
  - PCCPCH: scaled
  - SCH: scaled
  - PICH: not scaled
  - HS-SCCH: scaled

Send an LS to RAN4 to ask for advice on impact on RRM measurements of PCPICH scaling / lack of scaling for filtered UMTS – AT&T to prepare a draft in R1-140945.
Note that this will not delay the completion of the SI but may provide useful guidance for a future WI.

R1-140945	[DRAFT] LS on impact on RRM measurements of P-CPICH scaling for Filtered UMTS	AT&T	

Decision: The document is noted and modified as follows:
~~In order to make appropriate simulation assumptions,~~ RAN1 ~~needs~~ would like to understand ~~to decide on~~ how much power (Ec/Ior) should be allocated to P-CPICH in order to meet RAN4 RRM requirements since it ~~may~~would provide useful guidance for deciding between scalable UMTS specification options~~a potential WI~~.
2. Actions:
To RAN4
ACTION: RAN1 asks RAN4 to ~~analyse the UE RRM requirements of each of the two schemes and~~ provide recommendations on the P-CPICH overhead that is needed ~~in each case~~for the two schemes to meet RRM requirements.
In the Annex, add a description of pure filtered UMTS equivalent to the description of CZ-FUMTS.
Updated draft to be provided by Qualcomm in R1-140947 – approved in R1-140985.

Observation: The degradation in throughput performance due to scaling of overhead channels is in the range 10-15% for N=2 depending on the scaling factors applied; scaling prevents any useful throughput in the case of N=4.

R1-140716	Uplink Link Evaluation Results for Filtering in Scalable UMTS	Qualcomm Incorporated	

Decision: The document is noted. Comment that it would also be interesting to look at difference in Eb/No

R1-140794	Uplink performance of 1.25 MHz S-UMTS by Filtering	NSN	

Decision: The document is noted. Correction to section 6.8.2.2.2 is agreed.

R1-140813	Filtered UMTS with and without Chip Zeroing - Initial Link Level Simulation Results	Ericsson	

Decision: The document is noted.

Observations based on R1-140813:

- These results are consistent with those in the TR
- The performance of F-UMTS and CZ-UMTS is comparable at low data rates
- At 1Mbps the difference is around 0.5dB for 2.5MHz;
  - The performance difference may differ for different bandwidths and may also be reduced if receiver optimisations are considered.
- Above 1.2Mbps, the difference reduces.

R1-140884	Filtered UMTS with and without chip zeroing - Further simulation results	Ericsson	

Decision: The document is noted.

R1-140821	Text Proposal on Link Level Simulation Results for Filtered UMTS with and without Chip Zeroing	Ericsson	

Decision: The document is noted.

R1-140815	Filtered UMTS with and without Chip Zeroing and Multiple Users - Initial Link Level Simulation Results	Ericsson	

Decision: The document is noted.

Observations:

- Chip zeroing shows a marginal improvement in all the low-rate cases studied here compared to filtered UMTS
- Higher data rate cases have not been studied here.

R1-140823	Text Proposal on Link Level Simulation Results for Filtered UMTS with and without Chip Zeroing - Multiple Users	Ericsson	

Decision: The document is noted.

R1-140814	Carrier Bandwidth Impact on Filtered UMTS Performance	Ericsson	

Decision: The document is noted.

Observation: If FUMTS or CZ-FUMTS is specified, some flexibility in bandwidth may be possible, e.g. the exact carrier bandwidth need not be exactly 2.5 MHz.

R1-140715	Link Evaluation Results for AMR 12.2kbps for Standalone Scalable UMTS with Filtering	Qualcomm Incorporated	

Decision: The document is noted.
Observation: In the uplink, the two schemes have comparable performance since the the uplink voice operated at low SNR region. However, the downlink performance of filtered UMTS is slightly worse than the Enhanced filtered UMTS.

6.6.2 Evaluation for multi-carrier scenario

R1-140698	25.701 CR0006 (Rel-12,B) DL link level simulation results for multi-carrier filtered Scalable UMTS	Huawei, HiSilicon	

Decision: The document is noted.

R1-140719	Downlink Link Evaluation Results for Filtering in Multicarrier Scalable UMTS	Qualcomm Incorporated	

Decision: The document is noted.

R1-140717	System Simulation Results for Scalable UMTS with Filtering - Full Buffer	Qualcomm Incorporated	

Decision: The document is noted.

R1-140718	System Simulation Results for Scalable UMTS with Filtering - Bursty Traffic	Qualcomm Incorporated	

Decision: The document is noted.

R1-140697	25.701 CR0005 (Rel-12,B) Cross carrier scheduling for multi-carrier filtered S-UMTS	Huawei, HiSilicon	

Decision: The document is noted.

R1-140948	Way Forward on the addition of Simulation Results on Scalable UMTS with Filtering	Qualcomm, Huawei, HiSilicon, NSN, China Unicom	

Decision: The document is noted.

Agreements:

Include in the TR:

- Downlink Link Simulation Results
  - R1-140696 DL link level simulation results assuming N times overhead power ratio Huawei, HiSilicon
  - R1-140714 Downlink Link Evaluation Results for Filtering Qualcomm Incorporated
    - Describe these results as indicative of the relative comparison between CZ-FUMTS and FUMTS, and with UMTS with an 8% margin of uncertainty
    - Curves for inclusion in the TR should be limited to 20dB.
    - Only include results for N=2
    - Mention that results should not be compared with Time Dilated UMTS
    - List the different overhead assumptions used for each set of results
    - Mention that more realistic evaluations that are not shown here would use xxx assumptions
    - Mention that results for N=4 are not shown.
- Uplink Link Simulation Results
  - Put just the following text in the TR:
    - It is not yet possible to identify which filtering scheme for the uplink would be preferable from the results obtained, since the results and any conclusions that might be drawn from them have sensitivities to different assumptions, and these sensitivities need to be evaluated for different assumptions that are identified to be relevant.
- DCH
  - Include results from R1-140715 Link Evaluation Results for AMR 12.2kbps for Standalone Scalable UMTS with Filtering Qualcomm Incorporated
    - Plus observation recorded above.
- Carrier Aggregation
  - Include the following results:
  - R1-140719 Downlink Link Evaluation Results for Filtering in Multicarrier Scalable UMTS Qualcomm Incorporated
  - R1-140718 System Simulation Results for Scalable UMTS with Filtering - Bursty Traffic Qualcomm Incorporated
  - Note that the user penetration is assumed to be 100% etc. (use same text as for time dilated UMTS)
- SCH Analysis
  - Include the following results:
  - R1-140722 Searcher Analysis for Scalable UMTS with Enhanced Filtering Qualcomm Incorporated

- Performance of SCH with CZ
- R1-140795 SCH for S-UMTS NSN
  - Cell acquisition description and SCH design
- Note that SCH analysis without chip zeroing is not available.

Prepare a TP based on the above - R1-140984 – for email approval until Tuesday 25th February. - Qualcomm

6.6.3 Other

R1-140145	Structure of TR25.701	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted and agreed without the inclusion of sections 6.8.4 – 6.8.7.

Conclusion: Do not include sections 6.8.4 – 6.8.7 in the TR, but work on open issues list for SR.

Add to status report open issues list:
- Uplink
  - Uplink simulation assumptions and performance
  - Analysis of PAPR impacts of chip zeroing and filtering
  - Analysis of performance and feasibility of PRACH solutions
- Downlink
  - Downlink N=4 standalone performance
  - [Analysis of performance of filtered SCH without chip-zeroing]
- RAN2 and RAN4 have not been consulted on any aspects within their scope related to FUMTS. RAN1 does not have the expertise to assess these aspects even though some contributions were submitted on these topics.

Qualcomm and Ericsson to prepare a list of open issues using the above as a starting point for inclusion in the SR for agreement by email until Tuesday 25th February.

R1-140692	Considerations on filtered S-UMTS with chip zeroing	Huawei, HiSilicon	

Decision: The document is noted.

R1-140694	25.701 CR0002 (Rel-12,B) Control channel overhear for filtered S-UMTS	Huawei, HiSilicon	

Decision: The document is noted.

Observations:
- Operation of SCH with chip zeroing is feasible, with boosting to compensate the loss in autocorrelation peak (around 3dB for N=2 and up to 10dB for N=4)
- Operation of PRACH with and without chip zeroing is possible.
  - Study of PRACH performance has not been carried out.
- Possible methods for detecting system bandwidth have been identified.

R1-140722	Searcher Analysis for Scalable UMTS with Enhanced Filtering	Qualcomm Incorporated	

Decision: The document is noted.

R1-140795	SCH for S-UMTS	NSN	

Decision: The document is noted.

R1-140799	On RRC filter for S-UMTS	NSN	

Decision: The document is noted.

R1-140713	Enhanced Filtering for Scalable UMTS	Qualcomm Incorporated	

Decision: The document is noted. Ericsson considers PAPR to be an important aspect that is not covered in this paper.

R1-140725	Impact of Enhanced Filtering for Scalable UMTS	Qualcomm Incorporated	

Decision: The document is noted.

Qualcomm to prepare some text describing the possible alternatives for different channels including SCH and PRACH as an update to R1-140727 in R1-140946 – for email approval until Tuesday 25th February (Qualcomm), also including text from R1-140713, and Ericsson's comment on PAPR.

Also include text from R1-140697 on cross-carrier scheduling; discuss offline to see which parts to include.

Avoid use of "S-UMTS" acronym.

R1-140726	Specification Impact of Enhanced Filtering for Scalable UMTS	Qualcomm Incorporated	

Decision: The document is noted. The following points are not covered in this document:
- Impact of cross-carrier scheduling for multi-carrier scenarios
- Possible pilot pattern optimisations
- RAN2 impacts (could be an analysis of the delta compared to what has already been identified for time-dilated S-UMTS)
- RAN4 impacts, including possibly PAPR

R1-140727	TP on Impact of Enhanced Filtering for Scalable UMTS	Qualcomm Incorporated	

Decision: The document is noted.
When updating in R1-140945, change "3GPP specifications" to "RAN1 specifications", and mention RAN2/RAN4 impact: "Differences in RAN2/RAN4 impact compared to time-dilated S-UMTS have not been studied."

R1-140796	On configuration of S-UMTS cells	NSN	

Decision: The document is noted.

R1-140949	TP on conclusions	QUALCOMM Incorporated, Huawei, HiSilicon, NSN, China Unicom	

Decision: The document is noted. Replace uplink part with comment from R1-140984.
For email approval until Tuesday 25th February - R1-140988.

Friday 14th
For email approval until Tuesday 25th February of one package CRs to TR25.701 – (NSN)

Not treated.

R1-140144	Impacts of S-UMTS by filtering	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140720	TP on Enhanced Filtering for Scalable UMTS	Qualcomm Incorporated	
R1-140721	TP on Link Evaluation Results of Scalable UMTS with Filtering	Qualcomm Incorporated	
R1-140723	TP on Searcher Analysis for Scalable UMTS with Enhanced Filtering	Qualcomm Incorporated	
R1-140724	TP on System Simulation Results for Scalable UMTS with Filtering	Qualcomm Incorporated	
R1-140797	Impact of S-UMTS by filtering to higher layers	NSN	
R1-140798	Impact of S-UMTS by Filtering on RAN4 requirements	NSN	
R1-140817	Impact of Filtered UMTS and CZ-UMTS on UE Core Requirements	Ericsson	
R1-140818	Impact of Filtered UMTS on UE and BS Performance Requirements	Ericsson	
R1-140819	Impact of Filtered UMTS and its Optimization on RRM Requirements	Ericsson	
R1-140820	Impact of Filtered UMTS and CZ-UMTS on BS Core Requirements	Ericsson	
R1-140822	Text Proposal on Carrier Bandwidth Impact on Filtered UMTS Performance	Ericsson	

6.7 Other

R1-140677	Enhancement to uplink power control algorithm 2 to reduce power consumption of DL TPC commands	Huawei, HiSilicon	

Proposal 1: Agree to introduce enhancement to uplink power control algorithm 2 by means of allowing UE to do soft combining of TPC commands in a given number of slots.
Decision: The document is noted.

R1-140699	Considerations on further enhancements to Scalable UMTS	Huawei, HiSilicon	

Decision: The document is noted.

7 E-UTRA

7.1 Maintenance of E-UTRA Releases 8 – 11

New UE category (to support 450 Mbps data rate in the downlink)

R1-140106	Discussion on new UE category	Intel Corporation	

The document was presented by Alexei Davydov from Intel and proposes:

- Adopt in TS 36.306 a physical layer parameters of a new UE categories as proposed in Table 2.
- For Rel-11 UE Cats the maximum number of bits of a MCH transport block received within a TTI (=75376) can be kept the same as for associated Rel-10 UE Cat.
- A new Rel-11 Cat 9/10 UE must signal associated Rel-10 Cat 6/7 and Rel-8 Cat 4 to support backwards compatibility with Rel-10/9/8 eNBs.
- For new Rel-11 UE Cats reuse the existing rate matching patterns as associated Rel-10 UE Cats on any component carrier. Extend the Rel-10 rule defined in TS 36.212 as proposed in Figure 4.
- Reuse the existing UE procedures for storing the soft channel bits. Extend the Rel-10 rule defined in TS 36.213 as proposed in Figure 5.

Decision: The document is noted.

R1-140107	36.212 DraftCR (Rel-11. F) Correction to the rate matching to support new UE category	Intel Corporation	
R1-140108	36.213 DraftCR (Rel-11. F) Correction to the storing of soft channel bits to support new UE category	Intel Corporation	

The draft CRs are noted.

R1-140212	Discussion of introduction of New UE category in Rel-11	Huawei, HiSilicon	

The document was presented by Weimin Xiao from Huawei and proposes:

- Parameters related to new defined category 6a/7a in Rel-11 are shown in Tables 1-4
- A UE indicating category 6a shall also indicate category 4 and category 6. A UE indicating category 7a shall also indicate category 4 and category 7.
- UE should follow LBRM pattern of the Rel-11 category, when the UE is configured with transmission mode 10
- UE should store soft channel bits according to Rel-11 category, if the UE indicates a Rel-11 category.

Decision: The document is noted.

R1-140856	Proposal on new UE category	Huawei, HiSilicon	

The document was presented by Weimin Xiao from Huawei.
Decision: The document is noted.

At this point Mr Chair asked whether slides 2 and 3 (w.r.t Transport Block Sizes) could be agreed and whether any of below companies have a different proposal.

R1-140434	Draft CR 36212 New UE Category	Qualcomm Inc.	
R1-140435	Draft LS on New 450Mbps UE Category	Qualcomm Inc.	
R1-140646	On new UE categories for LTE Release 11	NVIDIA	
R1-140729	Discussion on UE category support for new 450 Mbps UE class	Ericsson	
R1-140730	[DRAFT] LS on introduction of new UE categories	Ericsson	
R1-140731	Draft CR on 36.212 Introduction of new UE categories	Ericsson	
R1-140838	Need for additional UE categories between UE category 7.1 and UE category 8	Sprint	

Fujitsu : be careful with the wording – RAN agreed introducing a new UE category, while RAN1 agreed on the details doing so – will be discussed when drafting the reply LS.

R1-140433	New 450Mbps UE Category	Qualcomm Inc.	

The document was presented by … from Qualcomm and proposes to:

- Introduce UE category 9 and 10 with the following principles;
  - Category 9: DL 450Mbps class paired with the UL processing requirement as defined for UL Cat. 6
  - Category 10: DL 450Mbps class paired with the UL processing requirement as defined for UL Cat. 7
- Adopt the downlink physical layer parameter values for the new UE categories shown in Table 1
- Adopt the uplink physical layer parameter values for the new UE categories shown in Table 2
- Define the following values for the "Maximum number of bits of a MCH transport block received within a TTI" for the new UE categories
  - Category 9: 75376 bits
  - Category 10: 75376 bits
- Modify the PDSCH rate matching parameters in TS36.212 [4] by introducing K_C = 3 for up to two layer MIMO and K_C = 1.5 for more than two layer MIMO for the new UE categories.
- Proposal 6: [RAN2] A UE indicating category 9 shall also indicate category 6 and category 4.
- Proposal 7: [RAN2] A UE indicating category 10 shall also indicate category 7 and category 4.
- Proposal 8: [RAN2] Introduce explicit network signalling to indicate the UE category among the signalled up to three categories that the UE shall assume.

Decision: The document is noted.

R1-140733	Draft CR on 36.306 Introduction of new UE categories	Ericsson	

The document was presented by Daniel Larsson from Ericsson and proposed Categories 9 and 10 be added to the specification. For backwards compatibility reasons, it is assumed that UEs indicating category 9 or 10, will also indicate cat. 6 or 7 respectively (and 4 to be Rel-8 compatible).
Discussion: Fujitsu → for signalling completeness, Cat 4 should be added.
Decision: The document is noted and agreed in principle.

R1-140732	Draft CR on 36.213 Introduction of new UE categories	Ericsson	

The document was presented by Daniel Larsson from Ericsson.
Decision: The document is noted and agreed in principle.

Conclusion:
Offline discussion on the followings until Tuesday morning – (Huawei)
- Necessity to introduce explicit network signalling to indicate the UE category
- Necessity of Categories 9/10 signal to Category 4
- Rate matching and soft buffer size
- Possible LS to RAN2

R1-140838	Need for additional UE categories between UE category 7.1 and UE category 8	Sprint	

The document was presented by John Humbert from Sprint and concludes to:
- Create two UE categories, one with a peak DL throughput of 516 and the other with a peak DL data rate of 689 Mbps. UL 64 QAM should be added as an optional feature
- Add a new UE category that supports DL 689 Mbps. UL 64 QAM should be added as an optional feature

Discussion: UL 64 QAM was already discussed in RAN (June 2013) – clarification needed to what the situation is.
Decision: The document is noted.

Wednesday morning:

R1-140878	Way Forward on New UE Category	Huawei, HiSilicon	

- Include in the LS to RAN2 stating "There is no agreement in RAN1 on the necessity to introduce explicit network signaling to indicate UE category".
- Include "and 4" in 36.306 CR
- No CR for 36.212 is needed for introduction of UE categories 9 and 10

Decision: The document is noted. Already included in the draft LS.

R1-140879	[Draft] LS on introduction of new UE categories	Huawei	

The document was presented by Daniel Larsson from Ericsson.
Discussion: NVIDIA → Concern about the sentence "there is no agreement in RAN1 on the necessity to introduce explicit network signalling to indicate UE category" – give the impression that RAN1 is still working on explicit signalling – could be removed as only Qualcomm asked for this add-on.
Qualcomm proposal: add "RAN1 is further discussing the applicability of TM3/4 4x4 MIMO to categories 9 and 10" – if the answer is no then there won't be explicit signalling, if the answer is yes then signalling will be TBD.
Decision: The document is noted. Final LS is agreed in R1-140898 assuming same content as R1-140879 and adding contact name Daniel (Ericsson).

Note: RAN1 can further discuss applicability of TM3/4 4x4 MIMO to categories 9 and 10

R1-140868	Draft CR on 36.306 Introduction of new UE categories	Ericsson	(R1-140733)

Discussion: Qualcomm → ok with the content at this stage.
Decision: The document is noted and CR is agreed.

R1-140869	36.213 CR0451 (Rel-11, F) Introduction of new UE categories	Ericsson	(R1-140732)

Decision: The document is noted and CR is agreed.

R1-140870	36.213 CR0452 (Rel-12, A) Introduction of new UE categories	Ericsson	

Decision: The document is noted and CR is agreed.

Qualcomm: still discuss the need for 36.212 CR
Friday 14th: No additional discussion about a potential 36.212 CR.

MBMS common search space

R1-140800	Clarification of search space monitoring for MBMS	Ericsson	

The document was presented by Mattias Frenne from Ericsson and deals with the support of eMBMS on Scell and particularly the issue of monitoring common search space on SCells. In the related RAN2 specifications, the UE is required to receive system information on the cell for which it is receiving the MBMS service, irrespectively of whether the cell is serving or not or whether it is a primary or secondary cell. To align 36.213 with RAN2 specifications, a CR0443 [R1-134984] containing this sentence was agreed in principle for Rel-12 UEs:

> The UE shall monitor common search space on a cell to decode the PDCCHs necessary to decode PMCH on that cell if configured to decode PMCH by higher layers.

CR0443 clarifies CSS monitoring on any cell where it decodes PMCH. Hence, the sentence is agnostic to whether the cell is a serving cell or non-serving cell and whether it is configured as a PCell or SCell to the UE. Therefore, CR0443 applies generally to any UE that support MBMS, is generic and applicable to both Rel-10 UEs and Rel-11 UEs
It is proposed to agree on the CR0443 for at least Rel-11 to align with RAN2 Rel-11 specifications. The associated CR for Rel-11 and Rel-12 are in [R1-140801],[R1-140802] respectively.
Decision: The document is noted.

R1-140801	36.213 CR0449 (Rel-11, F) Common search space monitoring for MBMS	Ericsson, AT&T, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted and CR is agreed in principle.

R1-140802	36.213 CR0450 (Rel-12, A) Common search space monitoring for MBMS	Ericsson, AT&T, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Discussion: Qualcomm want to delay the agreement due to RAN2 discussions and come back later in the week.
Both Ericsson, ALU wondered why such delay?
AT&T: why not to simply wait and confirm whether there is no impact (iOT)
Decision: The document is noted and CR is agreed in principle.

Conclusion: Check the necessity of CR header change until Friday (Ericsson)
Friday 14th

R1-141035	36.213 CR0449R1 (Rel-11, F) Common search space monitoring for MBMS	Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, AT&T	(R1-140801)
R1-141036	36.213 CR0450R1 (Rel-12, A) Common search space monitoring for MBMS	Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, AT&T	(R1-140802)

Both revised CRs were presented by Mattias Frenne from Ericsson and are agreed.

non-MBSFNregionLength

R1-140412	36.211 CR0187 (Rel-12. C) On PMCH starting symbol in an MBSFN subframe	Intel, Samsung, NEC, Panasonic, BlackBerry	

The document was presented by Seunghee Han from Intel and states that the higher layer parameter *non-MBSFNregionLength* are used to indicate the starting symbol $l_{PMCHStart}$ for PMCH transmission.

Decision: The document is noted and CR is agreed.

R1-140414	On use of higher layer parameter non-MBSFNregionLength	NEC	

The document was presented by Kevin Lin from NEC and concludes that there is a short period where MSI value of a MCH is unknown to a UE which is receiving the MCH, at the beginning of every MSP. It is asked whether the following is a common understanding in RAN1:

- a UE receiving a MCH may assume that higher layer parameter *non-MBSFNregionLength* applies in subframes where PMCH transmission may be expected without knowledge of MSI of the MCH, and
- it is not possible for a UE receiving a MCH and configured in TM9/10 to know if it will be scheduled with PMCH or possibly PDSCH until it finishes decoding MSI. Therefore, such UE may be expected to prepare for both.

Discussion: Panasonic → already captured in spec, but if needed, ok to discuss it off line.
Decision: The document is noted. No change for RAN1 specs. Continue offline discussions until Friday – (NEC)
Friday 14th
Takahiro Sasaki from NEC confirms that there is no need to clarify the UE behaviour in RAN1 when PMCH decoding carrying MSI is not completed.

On aperiodic SRS in two-symbol UpPTS

R1-140436	On aperiodic SRS in two-symbol UpPTS	Qualcomm Inc., CATT, Ericsson, Texas Instruments, Panasonic	

The document was presented by Wanshi Chen from Qualcomm and deals with one issue regarding A-SRS in a two-symbol UpPTS with I_{SRS}=0, and the following is proposed:

- There is no consensus in how to interpret type 1 SRS under I_{SRS}=0, i.e., whether to transmit SRS in one of the two UpPTS symbols or to transmit in both UpPTS symbols
  - No further specification clarification (Rel-10 and beyond) is necessary.

Decision: The document is noted.

R1-140672	SRS trigger type 1 and two-symbol UpPTS	Motorola Mobility	

The document was presented by Vijay Nangia from MoM and draws the following observations:

- Observation 1: There is no ambiguity whether the Rel-10 specification supports SRS transmission on both symbols in UpPTS. The specification text is valid for both SRS trigger type 0 and SRS trigger type 1.
- Observation 2: TDD SRS configuration index I_{SRS} = 0 assigns both symbols of UpPTS to the UE for SRS transmission.
- Observation 3: The specification does not support the interpretation of the UE behaviour to transmit in one of the two UpPTS symbols for SRS trigger type 1 and SRS configuration index, I_{SRS} = 0.
- Observation 4: There is no need for plural "s" in "transmission". The specification text is unambiguous.
- Observation 5: According to the specification, UE behavior for SRS trigger type 1, two symbol UpPTS and SRS configuration index I_{SRS} = 0 is to transmit SRS in both UpPTS symbols.

The Rel-10 specification text is unambiguous and UE behavior is defined for SRS trigger type 1, two symbol UpPTS and SRS configuration index I_{SRS} = 0. According to the specification, UE behavior is to transmit SRS in both UpPTS symbols.
Discussion: Qualcomm don't agree with the conclusion.
Panasonic suggested that it could be noted that one company claims that there is no ambiguity while others believe there is.
Decision: The document is noted.
Monday's afternoon: MoM suggested to let off line discussion continue and revisit on Friday. Samsung tend to go in MoM's view but also agree that there is no consensus within RAN1.

Possible conclusion: No further specification clarification (Rel-10 and beyond) is necessary.
Qualcomm/Ericsson: Why not, in order not to repeat the same discussion, to note that different implementations are allowed with current specifications.
SRS configuration #0 in Table 8.2-5 is reserved (CATT's comment)

Conclusion:

- Configuration #0 in Table 8.2-5 is reserved in Rel-10 and beyond
- CR shall be prepared – Revisit on Friday (Qualcomm)

Friday 14th

R1-141044	36.213 CR0453R1 (Rel-10, C) Modification to I_SRS = 0 for trigger type 1 SRS and TDD	Qualcomm Inc., Huawei, HiSilicon, Fujitsu, BlackBerry, LG Electronics, CATT, Nokia, NSN	(R1-141018)

R1-141045	36.213 CR0454R1 (Rel-11, A) Modification to I_SRS = 0 for trigger type 1 SRS and TDD	Qualcomm Inc., Huawei, HiSilicon, Fujitsu, BlackBerry, LG Electronics, CATT, Nokia, NSN	(R1-141019)
R1-141046	36.213 CR0455R1 (Rel-12, A) Modification to I_SRS = 0 for trigger type 1 SRS and TDD	Qualcomm Inc., Huawei, HiSilicon, Fujitsu, BlackBerry, LG Electronics, CATT, Nokia, NSN	(R1-141023)

The document was presented by Wanshi Chen from Qualcomm.
Decision: The documents are noted and the 3 CRs are agreed.

Others

R1-140256	Draft CR for introduction of LTE Coverage Enhancement.	ZTE	

The document was presented by Zhisong Zuo from ZTE and deals with the Rel-12 feature of TTI bundling enhancement for FDD with 3 HARQ processes.
Discussion: Mr Chair asked clarifying whether this was a Rel-12 CR: wrong current version of the spec, strange revision number?
Decision: The document is noted. May be included by spec editor in a unique Rel-12 CR (details to be further announced in the course of the week)

R1-140478	36.213 DraftCR (Rel-11. F) Correction to CSI processing in TM10	Intel Corporation	

The document was presented by Alexei Davydov from Intel and suggests modifying the text describing CSI calculation in TM10 to avoid possible ambiguities on the expected UE behavior.
Discussion: Different view from Huawei.
Decision: The document is noted.

R1-140517	Discussion on aperiodic CSI processing complexity in Rel-11 CoMP	Huawei, HiSilicon	

The document was presented by David Mazzarese from Huawei and provides the following clarifications for Rel-11 CoMP aperiodic CSI reporting:

- "CSI process" in the agreement and in the relevant specification text is equivalent to a "CSI", where a "CSI" is the association of a CSI process index and a CSI request received in one UL grant
- The UE is expected to determine N_u in every subframe where a CSI request is received
- N_u excludes the CSIs requested in the current subframe
- N_u excludes CSIs reported in the subframe where N_u is determined
- N_u includes all unreported CSIs, including the unreported CSIs that were already determined not to be expected to be updated

These points are understood to be non-ambiguous in the current specifications and given a reasonable interpretation of UE and eNB implementation, therefore no specification change is proposed for these clarifications. The potential ambiguity related to the duplicated instance of the word "other" may be corrected as follows:

- If seen as ambiguous, delete the first instance (CR) of "other" in "other N_u unreported CSI processes associated with other aperiodic CSI requests for the serving cell". If no ambiguity, then no CR needed.

Discussion: Intel → what about the other two proposals in R1-140478.
Decision: The document is noted.

Conclusion: Continue off line discussion until Friday (Intel)
Friday 14th

R1-141031	36213 CRxxxx (Rel-11, F) Correction to CSI processing in TM10	Intel Corporation, Huawei, HiSilicon	

The document was presented by Alexei Davydov from Intel who suggests to get it agreed in principle and let interesting companies review it more the details – ALU concern with the wording – the CR is for email approval by Friday 21st

R1-140495	36.213 CR0447 (Rel-12, F) Correction to CSI Reporting	Panasonic	

The document was presented by Alex Golitschek from Panasonic and corrects Table 7.2-1 and accompanying text that is contradicting other parts of sections 7.2, 7.2.1, 7.2.2 are voided/removed
Discussion: MCC: spelling error in Tdoc number.
Decision: The document is noted and CR is agreed.

R1-140782	36.213 CR0448 (Rel-12, F) Clarification on PUCCH Mode 1-1 for 4Tx Dual Codebook	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Rohde-Schwarz	

The document was presented by Min Zhang from ALU and proposes that the mode 1-1 is configured to be submode 1 or submode 2 by the higher layer signalling PUCCH_format1-1_CSI_reporting_mode when 4Tx dual codebook is configured for TM8, 9 and 10.
Decision: The document is noted and CR is agreed.

7.2 LTE Release 12

The document was presented by … from … and
Discussion: .
Decision: The document is noted.

7.2.1 Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation

WID in RP-121772.

R1-141010	Summary of Ad-hoc session on Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation	Ad-Hoc Chairman (Qualcomm)	

The document was presented by Wanshi Chen from Qualcomm and shows the outcomes of the eIMTA different sessions.
Decision: The document is endorsed and incorporated below with some add-ons.

7.2.1.1 Remaining details on UL power control

R1-140064	Summary of email discussion [75-36]: PHR for TDD eIMTA	CATT	

Decision: The document is noted.

R1-140892	WF on PHR mechanism for TDD eIMTA	Huawei, HiSilicon, Panasonic, Potevio, LGE, CATR, Sharp, Alcatel Lucent, Alcatel Lucent Shanghai Bell, Nokia, NSN, Interdigital	

- For PHR reporting and triggering
  - Observation: Current PHR mechanism is not sufficient for TDD eIMTA.
  - One of the alternatives can be selected
    - PHR for the two subframe sets are reported simultaneously
    - Representative PHR (e.g. the minimum PHR is reported)
    - Subframe dependent PHR triggering

Decision: The document is noted.

Revisit on Wed.:

Alt1: Current PHR mechanism is sufficient to support PHR for the two subframe sets and no enhancement is needed

Alt2: Current PHR mechanism can allow PHR for the two subframe sets but not sufficient and enhancement is needed

- The UE can be configured to report PHR for the two subframe sets simultaneously or report PHR follows the Rel-11 behavior
  - If a UE is configured with simultaneous PUCCH and PUSCH, the reported PHR for the two subframe sets include type 1 and type 2 PHR in PUCCH subframes and type 1 PHR otherwise
  - Otherwise, the reported PHR for the two subframe sets include type 1 PHR
- Further offline discussion on the details

Wednesday 12th

R1-140965	WF on PHR for eIMTA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Sharp, Huawei, HiSilicon, Nokia, NSN, LG Electronics, Potevio, InterDigital, MediaTek	(R1-140956)

Decision: The document is noted.

Agreement:

- Current PHR mechanism is sufficient to support PHR for the two subframe sets and no enhancement is needed

The following working assumptions from last meeting are confirmed:
- The association of (P0, alpha) with a UL subframe is separately configured via RRC
- For PUCCH PC, no enhancements (including both over-the-air and backhaul enhancements) relative to Rel-11

PUCCH

R1-140296	Remaining Details of Power Control enhancements for TDD eIMTA	LG Electronics	

Decision: The document (Section 2.2 only) is noted.

Agreements:

- Downlink association set index *K* for PUCCH TPC accumulation is determined according to the configured DL HARQ reference configuration.

TPC commands (3/3A, #0, configurable TPC or not)

R1-140109	Discussion on remaining details of UL power control for eIMTA support	Intel Corporation	

Decision: The document (Section 5 only) is noted.

R1-140344	UL Power Control for eIMTA – Basic Operation	Samsung	

Decision: The document (Section 2.2 only) is noted.

R1-140540	Remaining details on enhanced UL power control for TDD eIMTA	NSN, Nokia	

Decision: The document (Section 2 only) is noted.

Agreement:
- Accumulation of power control commands is not configurable between separate and joint for the two configured PUSCH subframe sets

Agreement:
- For the TPC commands in DCI formats 0/4/3/3A, the TPC commands are only applied to a subframe or subframes is per Rel-11 power command timing
  - That is, the power commands are only applied to the corresponding PUSCH/PUCCH power control process(es) associated with the subframe(s)

Power control for initial PUSCH

R1-140437	Remaining details of UL power control for TDD eIMTA	Qualcomm Inc.	

Decision: The document (Section 6 only) is noted.

Revisit on Thursday:
- Check whether or not the two PUSCH subframe sets can only be configured for eIMTA UEs.
- For contention based initial PUSCH transmission, the first subframe set (P0, alpha) is used
- For non-contention based initial PUSCH transmission, subframe set independent (P0, alpha) is applied if the UE is configured with two (P0, alpha) sets

Thursday 13th

Agreement:
- For initial PUSCH transmissions corresponding to RAR grant, Rel-11 power control is used

SRS

R1-140018	Remaining issues on power control for TDD eIMTA	Huawei, HiSilicon	

Decision: The document (Section 2 only) is noted.

R1-140260	Some Remaining Issues about Uplink Power Control	ZTE	

Decision: The document (Section 3 only) is noted.

R1-140871	WF on SRS in eIMTA	LG Electronics, CATT, Samsung, NSN, Nokia, Sharp	

Decision: The document is noted. Also supported by Huawei, HiSilicon, ALU, ASB

Proposed agreement:

- For type 1 SRS, the determination of the subframe where the type 1 SRS is due for transmission when triggered is based on SIB1
- For both type 0 and type 1 SRS, SRS transmissions can be configured in a UL subframe or UpPTS based on SIB1
  - If a UE detects L1 signaling conveying a valid UL-DL configuration for radio frame(s), and if the UL subframe or UpPTS for SRS transmission is changed to DL subframe, the UE shall drop the SRS transmission.
  - If a UE does not detect L1 signaling conveying a valid UL-DL configuration for radio frame(s),
    - (Working assumption only, revisit on Thursday): the UE still transmits the type 1 SRS in uplink subframes indicated based on SIB1, but the UE shall drop the type 0 SRS transmission in a subframe not indicated as UL subframe or UpPTS by the DL-HARQ reference configuration if there is no PUSCH transmission in the same subframe.
      - Further check offline whether the "if" condition may happen or not, and/or can be improved

Thursday 13th

Agreement:

- Under fallback, if the UE receives a UL grant corresponding to at least one UL subframe per SIB1 not in the set of UL subframes per DL HARQ reference configuration, the UE still treats it as a valid grant
- Under fallback, if the UE receives a NAK in PHICH triggering PUSCH transmission in a UL subframe per SIB1 not in the set of UL subframes per DL HARQ reference configuration, the UE transmits PUSCH

Agreement:

- For type 1 SRS, the determination of the subframe where the type 1 SRS is due for transmission when triggered is based on SIB1
- For both type 0 and type 1 SRS, SRS transmissions can be configured in a UL subframe or UpPTS based on SIB1
  - If a UE detects L1 signaling conveying a valid UL-DL configuration for radio frame(s), and if the UL subframe or UpPTS for SRS transmission is changed to DL subframe, the UE shall drop the SRS transmission.
  - If a UE does not detect L1 signaling conveying a valid UL-DL configuration for radio frame(s),
    - The UE still transmits the type 1 SRS in uplink subframes and special subframes indicated based on SIB1, but the UE shall drop the type 0 SRS transmission in a subframe not indicated as UL subframe or UpPTS by the DL-HARQ reference configuration if there is no PUSCH transmission in the same subframe.

R1-140983	Proposal on SRS fallback in TDD eIMTA	ZTE	

Decision: The document is noted.

Agreement:

- For SRS power control in a normal uplink subframe, the parameters of the PUSCH subframe set associated with the normal uplink subframe are used
- The RRC configured uplink subframe sets shall include special subframes in SIB1
- For SRS power control in a special subframe, the parameters of the PUSCH subframe set associated with the special subframe are used

CRS EPRE

R1-140872	WF on the downlink power control for eIMTA	LG Electronics, Ericsson, Sharp	

Decision: The document is noted. Revisit on Thursday.

Not treated.

R1-140062	Remaining details of uplink power control in TDD eIMTA	CATT	
R1-140063	PHR in TDD eIMTA	CATT	
R1-140234	Discussion on PHR in TDD eIMTA	MediaTek Inc.	
R1-140291	Remaining UL power control issue for e-IMTA	ASUSTeK	
R1-140345	UL Power Control for eIMTA – Remaining Issues	Samsung	
R1-140541	Power headroom report for enhanced UL power control in TDD eIMTA	NSN, Nokia	

R1-140632	Evaluation results on UL subframe sets signalling for enhanced UL PC	Sharp	
R1-140633	Remaining issues on PHR for eIMTA	Sharp	
R1-140734	On need of PHR enhancement for eIMTA	Ericsson	
R1-140854	Remaining details of UL power control for TDD UL-DL reconfiguration	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	(R1-140146)

7.2.1.2 Remaining details on CSI feedback

Aperiodic CSI

R1-140066	Summary of email discussion [75-37]: DL aperiodic CSI measurement and reporting for TDD eIMTA	CATT	

Decision: The document is noted.

Agreement:
For CSI measurements for transmission modes 1-9 for both non-CA and CA cases:
- The two agreements on CSI measurement "only within DL/S SFs indicated by the L1 signaling if a valid one is detected" and "only within DL/S SFs indicated by SIB1 if a valid one is not detected" will be captured in the specification

For CSI measurements for all transmission modes for both non-CA and CA cases:
- The subframe sets for CSI measurements can be configured per CC, and if so, they are semi-statically configured per CC

For aperiodic CSI reporting in transmission mode 1~9 for a single serving cell, only CSI for one subframe set is reported in any subframe

Revisit on Thursday:
For aperiodic CSI reporting in transmission mode 1~9 for a single serving cell
- Alt 1: The CSI is reported for the subframe set associated with the PDCCH subframe, where the association of the PDCCH subframe and the subframe set is RRC configured separately, where the RRC configuration covers at least 2 frames
- Alt 1': The CSI is reported for the subframe set associated with the PDCCH subframe, where the association of the PDCCH subframe and the subframe set is predefined by spec, i.e.,
  - For configuration #5, even frame for set 1 and odd frames for set 2
  - For all other TDD configurations, even subframe is associated with set 1 and an odd subframe is associated with set 2
- Alt 2: The CSI is reported for the subframe set associated with the CSI reporting subframe, where the association of the CSI reporting subframe and the subframe set is RRC configured separately, where the RRC configuration covers at least 2 frames
- Alt 2': The CSI is reported for the subframe set associated with the CSI reporting subframe, where the association of the PDCCH subframe and the subframe set is predefined by spec, i.e.,
  - For configuration #5, even frame for set 1 and odd frames for set 2
  - For all other TDD configurations, even subframe is associated with set 1 and an odd subframe is associated with set 2
- Alt 3: The CSI reported in subframe n is reported for the subframe set based on the subframe associated with the latest DL subframe between subframe n-4 and the PDCCH subframe
  - Further details to be provided how it works
- Alt 4: The CSI reported for a subframe set in subframe n is based on a dynamic indication

Thursday 13th
Email discussion till 21/2/2014 – (CATT) – on the above alternatives for aperiodic CSI reporting in transmission mode 1~9 for a single serving cell, also taking into account the proposals in R1-141020.

R1-141020	WF on CSI Feedback for TDD eIMTA in TM1-9	Qualcomm, Huawei, HiSilicon	

R1-140883	Way Forward on eIMTA CSI Feedback in TM10	Huawei, HiSilicon, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Qualcomm	R1-141042

Decision: The document is noted.

R1-140953	Way Forward on minimum number of CSI processes and CSI-IMR for TDD eIMTA	ZTE, Intel, LG Electronics	

Decision: The document is noted.

Email discussion till 28/2/2014 for A-CSI in TM10 and eIMTA – (Huawei)

- Take into account the WFs in R1-140953 and R1-141042
- Supporting companies for each proposal should provide detailed specification impact

R1-141042	Way Forward on eIMTA CSI Feedback in TM10	Huawei, HiSilicon, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Qualcomm	(R1-140883)

Periodic CSI

R1-140110	Discussion on remaining details of CSI feedback for eIMTA support	Intel Corporation	

Decision: The document (Section 5 only) is noted.

R1-140438	CSI measurement and reporting in eIMTA	Qualcomm Inc.	

Decision: The document (Section 2.3 only) is noted.

R1-140530	Remaining details of CSI feedback for TDD eIMTA	Texas Instruments	

Decision: The document (Section 3.3 only) is noted.

R1-141041	Way Forward on Periodic CSI Reporting for eIMTA	Intel, LGE, Qualcomm	

Decision: The document is noted.

Email discussion until 21/2/2014 regarding the proposals in R1-141041 – (Intel)

Agreement:

- The configuration of periodic CSI is such that the set of subframes for periodic CSI reporting are only in uplink subframes based on the DL HARQ reference uplink-downlink configuration configured for the UE.

Email discussion until 28/2/2014 on how to report P-CSI for flexible DL subframes when UE does not detect L1 signalling conveying a valid UL-DL configuration for a radio frame – (Qualcomm)

Not treated.

R1-140019	CSI enhancements for TDD eIMTA	Huawei, HiSilicon	
R1-140065	CSI feedback in TDD eIMTA	CATT	
R1-140147	Remaining details of CSI feedback for TDD UL-DL reconfiguration	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140221	On aperiodic CSI reporting in TDD eIMTA systems	HTC	
R1-140261	Remaining details of CSI feedback for TDD eIMTA	ZTE	
R1-140297	Remaining Details of CSI Measurement and Report for TDD eIMTA	LG Electronics	
R1-140346	Periodic CSI and SRS for eIMTA	Samsung	
R1-140347	Remaining issues on CSI feedback for eIMTA	Samsung	
R1-140430	Discussion on aperiodic CSI feedback for eIMTA	Potevio	
R1-140634	CSI enhancements for eIMTA	Sharp	
R1-140735	Remaining issues on CSI feedback for eIMTA	Ericsson	

7.2.1.3 Remaining details of signalling for TDD UL-DL reconfiguration

R1-140067	Remaining details of L1 signalling for UL-DL reconfiguration	CATT	

Decision: The document is noted.

R1-140111	Remaining aspects for TDD UL/DL reconfiguration signalling	Intel Corporation	

Decision: The document is noted.

R1-140187	Signalling for PUCCH/PUSCH configuration in eIMTA	Fujitsu	

Decision: The document is noted.

R1-140348	Signalling for TDD UL-DL Reconfiguration	Samsung	

Decision: The document is noted.

R1-140439	Discussion on signalling details for TDD UL-DL reconfiguration	Qualcomm Inc.	

Decision: The document is noted.

R1-140636	Valid UL/DL configuration and fallback conditions in eIMTA	Sharp	

Decision: The document is noted.

R1-140736	Remaining details on signalling for TDD UL-DL reconfiguration	Ericsson	

Decision: The document is noted.

Agreements:

- PUCCH is only transmitted in uplink subframes based on the DL HARQ reference uplink-downlink configuration configured for the UE.
- The following assumptions will be captured in the specification.
  - Whether to capture in the text format or a table format (e.g., the one in R1-140636) is up to 36.213 editor
  - For valid UL & DL reference configurations:
    - The set of UL subframes of the DL HARQ reference configuration should be a subset of the UL subframes of the UL HARQ reference UL/DL configuration
  - For validity of UL/DL configuration in a reconfiguration DCI under any valid UL & DL HARQ reference configurations:
    - The UE should not expect any subframe configured as UL subframe or special subframe in DL HARQ reference configuration is dynamically used as a DL subframe.
    - The UE should not expect any subframe configured as DL subframe or special subframe in UL HARQ reference configuration is dynamically used as a UL subframe.

The following working assumptions are confirmed:

- The size of DCI that carries reconfiguration bits is aligned to DCI format 1C.
- If UE does not detect L1 signaling conveying a valid UL-DL configuration for a radio frame,
  - UE shall monitor the non-DRX DL subframes or special subframes for PDCCH or EPDCCH as indicated by SIB-1 configuration
- 80ms periodicity for the reconfiguration signaling is supported.

Agreement:

- The number of eIMTA-RNTI configured for a UE is 1.
  - The eIMTA-RNTI is UE-specifically configured via RRC
  - Different UEs may be configured different eIMTA-RNTIs
- The set of subframes that UE monitors for the explicit reconfiguration DCI is UE-specifically configured via RRC
- The mapping between a reconfiguration index and a cell is UE-specifically configured via RRC

Working assumption:

- The explicit reconfiguration DCI only carries information for explicit reconfiguration
- To be confirmed on or before Thursday if no other consensus can be reached

Thursday 13th: It is agreed that:

- The explicit reconfiguration DCI only carries information for explicit reconfiguration

Agreement:

- The set of subframes that a UE is possibly configured to monitor the reconfiguration signalling are based on:
  - For 10ms periodicity, the set of subframes are the DL subframes per SIB1
  - For 20ms periodicity, the set of subframes are the DL subframes per SIB1 in the 2nd radio frame in the window
  - For 40ms periodicity, the set of subframes are the DL subframes per SIB1 in the 4th radio frame in the window
  - For 80ms periodicity, the set of subframes are the DL subframes per SIB1 in the 8th radio frame in the window

Agreement:
- The following is to be captured in the specification:
  - If a UE is configured to monitor in multiple subframes reconfiguration DCIs for radio frames $\{m\cdot T/10, m\cdot T/10+1, \cdots, (m+1)\cdot T/10-1\}$, the UE may assume the same UL-DL configuration indicated by the reconfiguration DCIs for radio frames $\{m\cdot T/10, m\cdot T/10+1, \cdots, (m+1)\cdot T/10-1\}$.
    - The same UL-DL configuration here refers to any cell configured for the UE with eIMTA-enabled

Revisit on Wed.:
- There are at least two possible UE behaviours:
  - UE is required to monitor all subframes to carry reconfiguration DCI(s) for radio frames $\{m\cdot T/10, m\cdot T/10+1, \cdots, (m+1)\cdot T/10-1\}$ until one valid UL-DL configuration for radio frames $\{m\cdot T/10, m\cdot T/10+1, \cdots, (m+1)\cdot T/10-1\}$ is detected and skips monitoring afterwards for radio frames $\{m\cdot T/10, m\cdot T/10+1, \cdots, (m+1)\cdot T/10-1\}$
  - UE is required to monitor all subframes to carry reconfiguration DCI(s) for radio frames $\{m\cdot T/10, m\cdot T/10+1, \cdots, (m+1)\cdot T/10-1\}$ until one valid UL-DL configuration is detected for radio frames $\{m\cdot T/10, m\cdot T/10+1, \cdots, (m+1)\cdot T/10-1\}$ and continues monitoring afterwards for radio frames $\{m\cdot T/10, m\cdot T/10+1, \cdots, (m+1)\cdot T/10-1\}$
- Whether or not/how to capture is FFS

Thursday 13th

Agreement:
- UE is required to monitor all subframes to carry reconfiguration DCI(s) for radio frames $\{m\cdot T/10, m\cdot T/10+1, \cdots, (m+1)\cdot T/10-1\}$ at least until one valid UL-DL configuration for radio frames $\{m\cdot T/10, m\cdot T/10+1, \cdots, (m+1)\cdot T/10-1\}$ is detected.
- How to capture the above is up to the spec editor

R1-140873	WF on UE assumptions in subframe #6 for eIMTA	LG Electronics, CATT, Sharp	

Decision: The document is noted.

Agreement:
- The following working assumption is confirmed:
  - Reconfiguration between 5ms and 10ms switching point periodicity shall be supported.

Revisit on Wed.

Proposed agreement:
- If the subframe #6 is a special subframe indicated by SIB1 but a regular DL subframe indicated by the dynamic subframe configuration, the UE shall assume subframe #6 is a regular DL subframe
  - Whether or not to explicitly capture this in the specification is up to spec editor

Thursday 13th

Agreement:
- If the subframe #6 is a special subframe indicated by SIB1 but a regular DL subframe indicated by the dynamic subframe configuration, the UE shall assume subframe #6 is a regular DL subframe for unicast traffic
- If the subframe #6 is a special subframe indicated by SIB1 but a regular DL subframe indicated by the dynamic subframe configuration, the UE shall assume subframe #6 is a regular DL subframe for broadcast traffic
- From RAN1 perspective, the above bullet regarding unicast and broadcast traffic will not cause significant issues
- Draft LS to RAN2 regarding the above bullets, and ask RAN2 to provide feedback whether there are significant issues from RAN2 perspective or not and if so, RAN1 will re-visit the above agreement – Zukang (CATT) R1-141024, agreed in R1-141025 with the following updates:
  - The sub-sub-bullet starting with "from RAN1 perspective" should be a sub-bullet
  - "RAN1 respectfully asks"

Not treated.

R1-140020	Remaining details of signalling for TDD UL-DL reconfiguration	Huawei, HiSilicon	

R1-140148	Remaining details of signalling for TDD UL-DL reconfiguration	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140262	Remaining Details of Signalling for TDD UL-DL Reconfiguration	ZTE	
R1-140298	Remaining Details of UL/DL Reconfiguration Signalling in TDD eIMTA	LG Electronics	
R1-140480	Remaining details on reconfiguration signalling for TDD eIMTA system	NEC	
R1-140531	On L1 signalling for dynamic TDD UL/DL reconfiguration	Texas Instruments	
R1-140542	Remaining details of signalling for TDD UL-DL reconfiguration	NSN, Nokia	
R1-140635	Remaining issues on changeability of switching period for eIMTA	Sharp	
R1-140881	WF on reconfiguration DCI for eIMTA	Huawei, HiSilicon, CATT, Intel	

7.2.1.4 Remaining HARQ details

R1-140070	Summary of email discussion [75-38]: PUCCH for TDD eIMTA	CATT	

Decision: The document is noted.

Working assumption:
- HARQ-ACK bundling is supported for HARQ-ACK feedback for TDD eIMTA, without further optimization w.r.t. bundling

Thursday 13th: It is agreed that:
- HARQ-ACK bundling is NOT supported for HARQ-ACK feedback for TDD eIMTA

Agreement:
- PUCCH format 1b with channel selection is supported for HARQ-ACK feedback for TDD eIMTA, along with the mapping table introduced in Rel-10 if eIMTA is enabled.
- PUCCH format 3 is supported for HARQ-ACK feedback for TDD eIMTA

Working assumption:
- Reuse the existing implicit PUCCH resource for subframes with the same DL HARQ timing between eIMTA and non-eIMTA UEs, and allocate new resources for other subframes in the bundling window, where the new resources are based on a separately RRC configured starting PUCCH offset (where the block interleaving for ACK/NAK resource indexing is still supported)

Thursday 13th: It is agreed that:
- For the case of PDCCH scheduling, reuse the existing implicit PUCCH resource for subframes with the same DL HARQ timing between eIMTA and non-eIMTA UEs, and allocate new resources for other subframes in the bundling window, where the new resources are based on a separately RRC configured starting PUCCH offset (where the block interleaving for ACK/NAK resource indexing is still supported)

Email discussion until 28/2/2014 - (NSN) on the case of EPDCCH scheduling regarding whether or not there are similar issues, and if so, whether or not the same solution for PDCCH can be adopted for EPDCCH. Also discuss for PDCCH the detailed equation for block interleaving and for PDCCH/EPDCCH the detailed subframe indexing.

Agreement:
- If TDD eIMTA is not enabled on the PCell but is enabled on at least one SCell, the UE behavior for HARQ-ACK feedback when PUCCH format 3 is configured follows that as specified in Rel-10/11.
- Otherwise, FFS (companies are encouraged to check R1-140069)

R1-140069	PUCCH for TDD eIMTA	CATT	

Decision: The document is noted.
Thursday 13th
Agreement:

- If TDD eIMTA is not enabled on the PCell but is enabled on at least one SCell, the UE behavior for HARQ-ACK feedback when PUCCH format 3 is configured follows that as specified in Rel-10/11.
- Otherwise:
  - Email discussion until 21/2/2014 – Zukang (CATT) - on whether to following Rel-10/11 approach or the one proposed in R1-141026 or any other possible approaches

R1-141026	Way forward on HARQ-ACK feedback with PUCCH format 3 configured for eIMTA	CATT	

Decision: The document is noted.

R1-140848	Summary of email discussion on HARQ-ACK feedback on PUSCH for eIMTA	Huawei, HiSilicon	

Decision: The document is noted.

Email discussion 21/2/2014 (Aris, Samsung) on the following alternatives and conclude for each case:
Case 1: Usage of UL DAI and UL index in DCI format 0/4

- Alternative 1: The UL index is used in DCI format 0/4, when UL-DL configuration 0 is configured as UL reference configuration.
- Alternative 2-1: The UL DAI can be used in DCI format 0/4, using UL DAI in all subframes for all the dynamically indicated configurations other than configuration #0 and assuming predefined subframe-specific UL index values.
- Alternative 2-2: The UL DAI can be used in DCI format 0/4, using UL DAI in all subframes for some of the dynamically indicated UL-DL configurations
  - For configurations #0 and #6: UL index
  - For other configurations: UL DAI
- Alternative 2-3: The UL DAI can be used in DCI format 0/4, where the usage of UL index or UL DAI in DCI format 0/4 depends on the index of DL/S subframe , i.e., using UL DAI in subframe #1 and #6 (with UL index value always set to 01).

Case 2: HARQ-ACK transmission on PUSCH when UL DAI is not transmitted in the latest subframe of bundling window

- Alternative 1: The number of HARQ-ACK bits is determined by UL DAI and no further specification is required.
- Alternative 2-1: The number of HARQ-ACK bits is determined by the size of the bundling window based on the DL HARQ timing reference configuration.
- Alternative 2-2: The number of HARQ-ACK bits is determined by the size of the bundling window of the dynamically indicated TDD UL-DL configuration.
- Alternative 2-3: The number of HARQ-ACK bits is determined by the sum of UL DAI plus X, where X is determined from the size of the bundling window for the DL HARQ timing reference configuration and the number of DL subframes located after the DL subframe used to transmit UL grant.

Not treated.

R1-140021	HARQ-ACK PUCCH resource allocation	Huawei, HiSilicon	
R1-140022	HARQ-ACK feedback bits on PUSCH	Huawei, HiSilicon	
R1-140068	Other remaining issues on HARQ in TDD eIMTA	CATT	
R1-140149	Remaining HARQ details for TDD UL-DL reconfiguration	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140222	HARQ details in TDD eIMTA systems	HTC	
R1-140235	Remaining HARQ details for TDD eIMTA	MediaTek Inc.	
R1-140263	Remaining HARQ details	ZTE	
R1-140299	Remaining Details of HARQ Feedback for TDD eIMTA	LG Electronics	
R1-140349	UCI Multiplexing in PUSCH	Samsung	
R1-140350	Remaining issues on HARQ timings for eIMTA	Samsung	
R1-140351	HARQ-ACK feedback procedures for eIMTA	Samsung	
R1-140431	On remaining details of HARQ for eIMTA	Potevio	
R1-140440	HARQ-ACK feedback on PUCCH for TDD eIMTA	Qualcomm Inc.	
R1-140441	HARQ-ACK feedback on PUSCH for TDD eIMTA	Qualcomm Inc.	
R1-140442	DRX operation for eIMTA	Qualcomm Inc.	

R1-140481	PUCCH and PHICH resource reservation for TDD eIMTA system	NEC	
R1-140482	HARQ-ACK on PUSCH for TDD eIMTA system	NEC	
R1-140496	UL Index and DAI bits in DCI format 0/4	Panasonic	
R1-140532	HARQ-ACK feedback on PUCCH for TDD EIMTA	Texas Instruments	
R1-140533	HARQ-ACK feedback on PUSCH for TDD EIMTA	Texas Instruments	
R1-140543	PUCCH formats for HARQ-ACK feedback	NSN, Nokia	
R1-140544	PUCCH resource allocation for HARQ-ACK feedback	NSN, Nokia	
R1-140545	UCI on PUSCH for TDD eIMTA	NSN, Nokia	
R1-140615	Remaining details of PUCCH design for eIMTA HARQ	NTT DOCOMO	
R1-140637	PUCCH resource allocation for dynamic HARQ-ACK in eIMTA	Sharp	
R1-140638	HARQ-ACK reporting on PUCCH and PUSCH for eIMTA	Sharp	
R1-140737	Remaining details on HARQ-ACK feedback for eIMTA	Ericsson	

7.2.1.5 Other

R1-140071	Other remaining issues for TDD eIMTA	CATT	

Decision: The document is noted.

R1-140444	Handling of MBMS and PRS with eIMTA	Qualcomm Inc.	

Decision: The document is noted.

Agreement:

- For PRS and MBMS, Rel-11 configuration and behavior are unchanged.

R1-141039	WF on Soft Buffer Management for TDD eIMTA9	Qualcomm, CATT, Samsung, LG Electronics, Sharp, ZTE, Ericsson	

Decision: The document is noted.

Agreement:
For soft buffer management for TDD eIMTA

- For a UE configured with TDD eIMTA, the value of M_{DL_HARQ} shall be determined by RRC configured DL HARQ reference configuration for soft buffer management

Friday 14th
Email approval until 14th March about RRC parameter lists – Zukang (CATT)
Email discussion/approval until 19th February w.r.t remaining open issues (focus on RAN2 possible impact) that have not been treated during the online session – Zukang (CATT)

Not treated.

R1-140023	Soft buffer partitioning for eIMTA DL transmission	Huawei, HiSilicon	
R1-140300	Other Design Aspects for TDD eIMTA	LG Electronics	
R1-140352	On other issues for eIMTA	Samsung	
R1-140402	Maximum number of DL HARQ processes for TDD eIMTA	ITRI	
R1-140403	Further discussion on backhaul signalling details in TDD eIMTA	ITRI	
R1-140443	Soft buffer management for IMTA	Qualcomm Inc.	
R1-140579	Dynamic TDD UL:DL configuration hopping for eIMTA	CEWiT	
R1-140607	Discussion on the remaining open issues for eIMTA	Broadcom Corporation	
R1-140738	Further details for eIMTA	Ericsson	

7.2.2 Low Cost & Enhanced Coverage MTC UE for LTE

WID in RP-130848

R1-141011	Summary of Ad-hoc session on Low Cost & Enhanced Coverage MTC UE for LTE	Ad-Hoc Chairman (Qualcomm)	

The document was presented by Wanshi Chen from Qualcomm and shows the outcomes of the MTC different sessions.

Decision: The document is endorsed and incorporated below with some add-ons.

7.2.2.1 Remaining details of new UE category/type

R1-140024	Discussion on TBS and simultaneous reception between common messages and unicast data for new category UEs	Huawei, HiSilicon	

Decision: The document is noted.

R1-140353	Remaining details of new UE category/type	Samsung	

Decision: The document is noted.

R1-140497	Views on FFS on new UE category/type	Panasonic	

Decision: The document is noted.

R1-140583	Transport Block Size support in low-complexity MTC UEs	Sony	

Decision: The document is noted.

R1-140865	Way forward on some issues for low complexity MTC UE	Vodafone	

Decision: The document is noted.

Agreements:
For PDSCH of the low complexity MTC UEs at least not in coverage enhancement:
- The maximum TBS shall be 1000 bits for unicast transmission on PDSCH.
- The maximum TBS shall be 2216 bits for data types referenced by SI-RNTI, P-RNTI, and RA-RNTI.

Prepare a reply LS to R1-140005 (Vodafone) – check on Thursday
Thursday 13th

R1-140980	DRAFT Reply to LS on mobility support for LC MTC UEs and MTC coverage enhancement	Vodafone Group	

Decision: The document is noted and agreed in principle with the following updates:
- Remove the head regarding RAN2 related tdoc number
- CC RAN
- ~~After careful consideration and discussion, t~~The following has been agreed in RAN1 for the low complexity MTC UE not ~~operating~~ in coverage enhancement ~~functionality.~~:
- In actions to RAN2, further asking RAN2 whether there are issues to have 2216 bits for data types referenced by P- and RA-RNTI.

Update the LS by incorporating the above changes (Vodafone) Revisit on Friday. R1-141028
Final LS is agreed in **R1-141029**.

Proposed working assumption
- For the low complexity MTC UEs, these UEs support 15-RB PDSCH assignment(?)/bandwidth(?)
- Revisit on Thursday

Proposed agreement:
- Scheduling and HARQ timing for PDSCH and PUSCH for the low complexity MTC UEs not in coverage enhancement are the same as other UE categories
- Further discussion offline, revisit on Thursday
  - Related issues: DL system bandwidth, PDSCH scheduling (dynamic, semi-static, predetermined), EPDCCH vs. PDCCH

Thursday 13th

R1-140981	Summary of further discussions on MTC low complexity UE	Vodafone Group	

Decision: The document is noted.
Send an LS to RAN2/RAN3 asking RAN2/RAN3 whether it is possible for an eNB to know whether a UE is TBS/bandwidth limited or not for paging and random access response – (ALU), check on Friday R1-141009
Friday 14th

R1-141009	Draft LS on Identification of TBS/bandwidth limited UE by eNB	Alcatel-Lucent	R1-141033

Decision: The document is noted and final LS is agreed in R1-141033.

Agreement:
- # HARQ processes for MTC UEs not in coverage enhancements:

- Keep the same number of processes unchanged from Rel-11
  - For HD-FDD, FFS

Email discussion until March 14, 2014 on scheduling options for UEs not in coverage enhancements for broadcast and unicast channels, to further clarify tradeoffs of each option (refer to R1-140981) – Gustav, Sierra Wireless

Not treated.

R1-140072	Remaining details of new UE category/type	CATT	
R1-140073	Downlink bandwidth reduction for new category/type UEs	CATT	
R1-140113	Remaining issues of new UE category/type for low cost & enhanced coverage MTC UE	Intel Corporation	
R1-140150	Details of low cost MTC UE category	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140237	Max TBS and simultaneous reception of common messages and unicast data	MediaTek Inc.	
R1-140279	Remaining details of new UE category for low cost MTC	ZTE	
R1-140301	Further discussion on details of new UE category/type	LG Electronics	
R1-140445	Remaining details of UE category type	Qualcomm Inc.	
R1-140518	Low Cost UE TBS and PRB limits discussion	Sierra Wireless	
R1-140547	Low-Cost MTC UE Category	NSN, Nokia	
R1-140582	Remaining details of bandwidth reduction for low-complexity MTC UEs	Sony	
R1-140639	Remaining issues on low-cost MTC Ues	Sharp	
R1-140739	Maximum BCCH TBS for low cost MTC UE	Ericsson	
R1-140740	Simultaneous reception in low cost MTC UE	Ericsson	
R1-140741	Resource allocation for low cost MTC UE	Ericsson	

7.2.2.2 Techniques for coverage improvement

Not treated.

R1-140238	System information transmission in coverage enhancement mode	MediaTek Inc.	
R1-140498	Proposal of common coverage enhanced subframe length	Panasonic	
R1-140499	Attempt of the summary of the email discussion on the handling on PRACH for enhanced coverage mode	Panasonic	

7.2.2.2.1 PBCH

Not treated.

R1-140025	Details on PBCH repetitions for coverage enhancement	Huawei, HiSilicon	
R1-140074	Further discussion on PBCH coverage improvement for MTC UEs	CATT	
R1-140151	Coverage enhancement for PBCH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140188	PBCH and System Information Support for Coverage Enhanced (CE) Devices	Fujitsu	
R1-140223	PBCH Coverage Improvement for MTC Devices	HTC	
R1-140280	PBCH Coverage Enhancement for MTC UEs	ZTE	
R1-140281	Discussion on SIB Coverage Improvement for MTC UEs	ZTE	
R1-140302	PBCH transmission for MTC coverage enhancement	LG Electronics	
R1-140303	Evaluation on PBCH coverage enhancement for MTC	LG Electronics	
R1-140354	PBCH Coverage Enhancements for MTC UEs	Samsung	
R1-140446	PBCH channel design for MTC coverage enhancements	Qualcomm Inc.	
R1-140500	PBCH coverage enhancement for low cost MTC	Panasonic	
R1-140519	MIB and SIB Acquisition Time Discussion and Guidance	Sierra Wireless	
R1-140520	2X PBCH Repetition (option 1) Results and Evaluation	Sierra Wireless	
R1-140548	PBCH Coverage Enhancement	NSN, Nokia	

R1-140648	PBCH Coverage Enhancement for MTC UE	InterDigital	
R1-140742	System information for enhanced coverage MTC UE	Ericsson	
R1-140827	Coverage improvement for PBCH	Intel Corporation	(R1-140114)

7.2.2.2.2 PRACH

Not treated.

R1-140026	Considerations on PRACH repetition levels and power adjustment of PRACH transmission	Huawei, HiSilicon	
R1-140027	PRACH resource multiplexing to support low cost MTC and coverage enhancement	Huawei, HiSilicon	
R1-140075	Remaining details on PRACH coverage improvement for MTC UEs	CATT	
R1-140115	Coverage improvement for PRACH	Intel Corporation	
R1-140152	Details of PRACH preamble coverage enhancement	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140153	Coverage enhancement for RACH messages	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140189	PRACH Support for Coverage Enhanced (CE) Devices	Fujitsu	
R1-140190	Coverage Depth Signalling supporting Low Cost MTC devices	Fujitsu	
R1-140278	PRACH Coverage Enhancement for MTC UEs	ZTE	
R1-140304	PRACH transmission for MTC coverage enhancement	LG Electronics	
R1-140305	RACH procedure for MTC coverage enhancement	LG Electronics	
R1-140355	PRACH Coverage Enhancements for MTC UEs	Samsung	
R1-140447	RACH channel design for MTC coverage enhancements	Qualcomm Inc.	
R1-140549	PRACH Coverage Enhancement	NSN, Nokia	
R1-140616	Discussion on multi-level PRACH coverage enhancement	NTT DOCOMO	
R1-140640	On PRACH coverage enhancement for MTC UE	Sharp	
R1-140649	PRACH Coverage Enhancement for MTC UE	InterDigital	
R1-140743	Random access for enhanced coverage MTC UE	Ericsson	

7.2.2.2.3 (E)PDCCH/PUCCH

R1-140028	Discussion on issues for PDCCH coverage improvement	Huawei, HiSilicon	

Decision: The document is noted.

R1-140240	Analysis on (E)PDCCH search space design in coverage enhancement mode	MediaTek Inc.	

Decision: The document is noted.

FFS at least the following issues:

- The set of aggregation level(s)
  - The set of repetition level(s)
  - The number of decoding candidate(s)
  - The starting subframe for a decoding candidate
  - Linkage of resources across subframes for a same decoding candidate
    - Whether or not a same or different aggregation levels can be used in different subframes of a same decoding candidate
  - Considering impact on other MTC UEs and normal UEs

R1-141030	PDCCH structure for MTC enhanced coverage	Vodafone Group	

Decision: The document is noted.

Agreement:

At least for unicast traffic:

- UE shall monitor more than one (E)PDCCH decoding candidate.
- FFS whether or not UE shall monitor multiple total aggregated resources of (E)PDCCH decoding candidates
  - This is for illustration only:

  - A Total Aggregated Resource (TAR) can be defined for a decoding candidate such that the TAR is given by Sum (a_i) where i = 0…T-1, where T is repetition number and a_i is the amount of resources in subframe *i*. It is FFS whether a_i is the same or different in different subframes.
  - Whether or not multiple TARs are monitored by a UE is FFS.
- The UE shall use the same (E)PDCCH decoding candidate m with an aggregation level defined for each subframe within the repetition window.

- FFS whether or not the option of UE monitoring only a single aggregation level with a single repetition is excluded.

- FFS whether to use the current hashing function, or a new method, to determine the starting location of unicast search space at each subframe within the repetition window. This depends on collision probability between UEs in coverage enhancement mode and normal UEs in a cell.
- Study tradeoff and performance of the following options:
  - Option 1: single (E)CCE aggregation level and multiple repetition levels
  - Option 2: multiple (E)CCE aggregation levels and single repetition level
  - Option 3: multiple (E)CCE aggregation levels and multiple repetition levels
  - Examples of the options can be found in R1-141030

Not treated.

R1-140029	Discussion on issues for PUCCH coverage improvement	Huawei, HiSilicon	
R1-140076	Necessity of (E)PDCCH scheduling PDSCH for SIB/paging/RAR	CATT	
R1-140077	Details on (E)PDCCH coverage improvement for MTC UEs	CATT	
R1-140078	PUCCH coverage improvement details for MTC UEs	CATT	
R1-140116	Coverage improvement for (E)PDCCH and PUCCH	Intel Corporation	
R1-140154	Coverage enhancement for (E)PDCCH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140239	On the need of (E)PDCCH for SIB. RAR and Paging	MediaTek Inc.	
R1-140275	Discussion on PUCCH Coverage Improvement	ZTE	
R1-140277	Discussion on (E)PDCCH Coverage Improvement	ZTE	
R1-140306	(E)PDCCH transmission for MTC coverage enhancement	LG Electronics	
R1-140307	Evaluation on PDCCH coverage enhancement for MTC	LG Electronics	
R1-140308	UL channel transmission for MTC coverage enhancement	LG Electronics	
R1-140356	PDCCH Coverage Enhancements for MTC UEs	Samsung	
R1-140357	PUCCH Coverage Enhancements for MTC UEs	Samsung	
R1-140415	(E-)PDCCH for enhanced coverage of low cost MTC	NEC	
R1-140448	Coverage enhancements for (E)PDCCH/PUCCH	Qualcomm Inc.	
R1-140483	Power consumption issue in monitoring PDCCH of enhanced coverage MTC UE	NEC	
R1-140484	Method for saving battery power in monitoring PDCCH of enhanced coverage MTC UE	NEC	
R1-140501	(E)PDCCH coverage enhancement for MTC	Panasonic	
R1-140550	PDCCH Coverage Enhancement	NSN, Nokia	
R1-140551	PUCCH Coverage Enhancement	NSN, Nokia	
R1-140584	Necessity of PDCCH for common messages for coverage extended MTC UEs	Sony	
R1-140585	(E)PDCCH candidates during MTC coverage extension repetition	Sony	
R1-140586	Common search space RNTI handling in PDCCH repetition	Sony	
R1-140617	RNTI handling in (E)PDCCH coverage enhancement	NTT DOCOMO	
R1-140641	Discussion on PUCCH for MTC UEs in coverage enhanced mode	Sharp	
R1-140673	MTC Coverage improvement for Control Channels	Motorola Mobility	
R1-140744	On PDCCH/EPDCCH mapping for enhanced coverage MTC UE	Ericsson	

R1-140745	On enhanced DCI coverage for MTC UE	Ericsson	
R1-140746	On common control channels for enhanced coverage MTC UE	Ericsson	
R1-140747	HARQ timing for enhanced coverage MTC UE	Ericsson	

7.2.2.2.4 PDSCH/PUSCH

Not treated

R1-140030	Coverage enhancements on PDSCH and PUSCH	Huawei, HiSilicon	
R1-140079	Paging coverage improvement details for MTC UEs	CATT	
R1-140080	PDSCH/PUSCH coverage improvement for MTC UEs	CATT	
R1-140156	Coverage enhancement for PDSCH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140157	Coverage enhancement for PUSCH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140241	Discussion on CSI report in coverage enhancement	MediaTek Inc.	
R1-140242	Discussion on HARQ realization for PUSCH in coverage enhancement	MediaTek Inc.	
R1-140276	Discussion on PDSCH/PUSCH Coverage Improvement	ZTE	
R1-140309	PDSCH transmission for MTC coverage enhancement	LG Electronics	
R1-140358	PDSCH/PUSCH Coverage Enhancement for MTC UEs	Samsung	
R1-140416	Frequency diversity transmission for enhanced coverage MTC	NEC	
R1-140417	Uplink Reference Signal Enhancement for Low Cost MTC	NEC	
R1-140449	Coverage enhancements for PDSCH/PUSCH	Qualcomm Inc.	
R1-140552	PUSCH Coverage Enhancement	NSN, Nokia	
R1-140674	MTC Coverage improvement for Data Channels	Motorola Mobility	
R1-140748	Data transmission for enhanced coverage MTC UE	Ericsson	

7.2.2.2.5 SS

Not treated.

R1-140413	Consideration on acquisition of SS and system information for coverage improvement	Intel Corporation	

7.2.2.2.6 Other

Not treated.

R1-140081	Alternative mechanism to PCFICH and PHICH functionality	CATT	
R1-140117	Coverage improvement for PCFICH and PHICH	Intel Corporation	
R1-140158	Consideration on coverage enhancement for PCFICH and PHICH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140205	Discussion on SIB coverage enhancement	Huawei, HiSilicon	
R1-140667	Considerations on simplified functionalities of PCFICH for low-cost MTC UEs	ITL Inc.	
R1-140749	Mode selection for enhanced coverage MTC UE	Ericsson	

Friday 14th

Telecom Italia commented that unfortunately they could not attend MTC due to being involved in D2D. They raised the question whether assessment of the cost/complexity that is going to be moved on network side due to MTC low cost UE has been evaluated. Vodafone expressed their surprise why such questioning comes so late at the stage of the work. Telecom Italia simply requested their comment to be minuted.

7.2.3 LTE TDD-FDD Joint Operation including Carrier Aggregation

WID in RP-131399.

7.2.3.1 TDD – FDD carrier aggregation

R1-140315	Summary of email discussion on DL HARQ timing for TDD-FDD carrier aggregation with self-carrier scheduling	LG Electronics	

The document was presented by Joon Kui Ahn from LGE and recommends introducing HARQ timing option 1-1. For further details of option 1-1, the following options are recommended.

- CHsel option 2: Bundling ACK/NACK bits for DAI ≥ 4
  - Further discussion is needed on solutions for handling missing DAI > 4
- Proposal PF3) For TDD PCell and FDD SCell with HARQ timing option 1, when configured with PF3, maximum number of aggregated cells can be limited for the M>4 cases so that number of ACK/NACK bits on PF3 does not exceed 21.

Discussion: Ericsson → ok with option 1-1 assuming PUCCH format 3 only with M>=4.
Fujitsu also support option 1-1
Huawei → if we follow Ericsson's view then option 1-2 should be used.
Decision: The document is noted.

R1-140864	WF on HARQ timing for TDD-FDD CA	LG Electronics, ETRI, DOCOMO, Nokia, NSN, Samsung, ITL, Orange, NEC	

The document was presented by Joon Kui Ahn from LGE.

- When configured with ACK/NACK channel selection, for M>4, UE bundles (logical-AND operation) ACK/NACK bits for DAI ≥ 4 into single HARQ ACK/NACK bit to reuse the Rel-11 channel selection table
  - UE behaviour for handling of missing DAI>4 shall be decided between following two alternatives:
    - Alt. 1: When the total number of correctly received PDSCHs exceeds 4, the UE shall use the HARQ-ACK resource value transmitted in the TPC field on the last received PDCCH/EPDCCH for PDSCH scheduling
    - Alt. 2: For M>4, UE can understand if there exists more PDCCH/EPDCCH to be transmitted for PDSCH scheduling in the next DL subframe(s) within the HARQ-ACK bundling window by the value of the TPC field in the DCI transmitted with DAI>=4 for the SCell
- When configured with PF3, maximum number of aggregated cells is limited for the M>4 cases so that number of ACK/NACK bits on PF3 does not exceed 21.

Decision: The document is noted.

Option 1-1) LG, NEC, ZTE, Samsung, Orange, NTT DOCOMO, Nokia*, NSN*, Sharp, ETRI, KDDI, KT Corp., ITL, Ericsson, Fujitsu, Hitachi
Option 1-2) LG, Samsung, Orange, NTT DOCOMO, Huawei, HiSilicon, KDDI, KT Corp., ITL, Hitachi
Option 2c-B) Nokia, NSN, ALU, ASB, CMCC, CATT, CATR, Potevio, Coolpad
Option 2c-B1) Nokia, NSN, ALU, ASB, CMCC, CATT, CATR, Potevio, Coolpad
Option 2c-B2) Huawei, HiSilicon, CMCC
* NNSN is fine with option 1-1 with the following addition (CHsel option 2-2)

CATT – CMCC objected agreeing on option 1-1. Use cases and benefits of option 1-1 are unclear and specification impacts due to higher complexity. CATT asked operators clarifying the use cases of TDD PCell.

Tuesday morning session conclusion

- Majority companies support Option 1-1
- Continue offline discussion until Thursday

For TDD PCell and FDD SCell with HARQ timing option 1, when configured with PF1b with channel selection, HARQ-ACK bits for DAI>=4 for each cell are bundled by logical-AND operation. For PDSCH transmission on the FDD SCell indicated by the detection of PDCCH in subframes k_m, m=4 or m=5, if the total number of detected PDCCHs exceeds 4, the UE shall use the TPC field in the last received PDCCH to determine the HARQ-ACK resource values.

Thursday 13th

R1-140958	Alternative WF on HARQ timing for TDD-FDD CA	LG Electronics, NTT, NTT DOCOMO, Ericsson, ETRI, Panasonic	

The document was presented by Joon Kui Ahn from LGE.

- HARQ-ACK timing for DL self-scheduling of FDD SCell in case of TDD PCell is defined as in following table

HARQ timing	Subframe *n*									
	0	1	2	3	4	5	6	7	8	9
0A	-	-	6, [5]	[5], [4]	4	-	-	6, [5]	[5], [4]	4

1*			7, 6	[6], [5], 4				7, 6	[6], [5], 4	
2	-	-	8, 7, 6, [5], 4	-	-	-	-	8, 7, 6, [5], 4	-	-
3	-	-	11, [10], [9], [8], 7, 6	6, 5	5, 4	-	-	-	-	-
4	-	-	12, 11, [10], [9], 8, 7	7, 6, 5, 4						
5	-	-	13, 12, 11, [10], 9, 8, 7, 6, 5, 4	-	-	-	-	-	-	-
6	-	-	[8], 7	7, [6]	[6], 5	-	-	7	7, [6], [5]	-

- ACK/NACK channel selection can be configured only with the TDD PCell UL/DL configurations which don't require DL HARQ timing with M>4 on the FDD SCell.
- When configured with PF3, maximum number of aggregated cells is limited for the M>4 cases so that number of ACK/NACK bits on PF3 does not exceed 21.

Discussion: Also supported by KDDI, KT Corp., Sharp, NEC, Nokia, NSN, Hitachi, Sony
Samsung is OK with the addition of the following sub-bullet under second bullet:
  - "HARQ ACK feedback with PUCCH format 1B with channel selection is supported only for configurations #0, #1, and #6

Decision: The document is noted.

R1-140977	Way forward on FDD Scell PDSCH HARQ timing with TDD as Pcell	CATT, ALU, ASB, CMCC, CATR, HTC, III, Potevio, Coolpad, Huawei, HiSilicon, Blackberry	

The document was presented by Zukang Shen from CATT.

- For the case of TDD as Pcell and FDD as Scell and self-carrier scheduling, the PDSCH HARQ timing on the FDD Scell follows a DL reference TDD UL-DL configuration
  - The DL reference TDD UL-DL configuration for the FDD Scell is determined by the following table

TDD Pcell UL-DL configuration	Allowed DL reference TDD UL-DL configuration for FDD Scell (2 aggregated cells)	Allowed DL reference TDD UL-DL configuration for FDD Scell (more than 2 aggregated cells)
0	5	2
1	5	2
2	5	2
3	5	4
4	5	4
5	5	N/A
6	5	2

Discussion: Also supported by ITRI.
Decision: The document is noted.

Conclusion:
No consensus about TDD Pcell DL HARQ timing for TDD-FDD carrier aggregation with self-carrier scheduling, neither R1-140958 or R1-140977 – some suggested to report and let plenary decide
Fujitsu: Plenary won't be able to make decision on such details – confirmed by Mr Chair
CATT: let's plenary decide whether to extend or change the scope of WID
Nokia (rapporteur): requested the above conclusion to be clearly noted into the minutes

Cross-carrier scheduling

R1-140209	Summary of email discussion for cross-carrier scheduling for TDD-FDD CA	Huawei, HiSilicon	

Decision: The document is just noted.

R1-140210	WF on TDD-FDD CA for cross-carrier scheduling	Huawei, HiSilicon, ETRI, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, LG Electronics, Intel, ITL, Samsung, NEC, Sharp, Ericsson, Nokia, NSN	

The document was presented by David Mazzarese from Huawei.

- For DL cross-carrier scheduling: agree on Alt DL-A
  - For DL cross-carrier scheduling with PUCCH on PCell-only, the DL HARQ timing of the scheduled serving cell follows the PCell's timing.
  - If the PCell is TDD, the PCell's timing is defined as:
    - DL HARQ timing determined according to the PCell's SIB1 UL/DL configuration, or DL-reference HARQ timing of the PCell for eIMTA
- Proposed agreement for UL cross carrier scheduling if the scheduling serving cell is FDD and the scheduled serving cell is TDD:

  - For UL cross-carrier scheduling where PHICH is transmitted on the scheduling serving cell, the scheduling/HARQ timing of TDD scheduled serving cell follows the TDD scheduled serving cell's UL/DL configuration.
    - For eIMTA the TDD scheduled serving cell's UL/DL configuration is the SIB1 UL/DL configuration signaled by tdd-Config-r10
    - PHICH-less operation is carried out for the UL subframes corresponding to I_{PHICH}=1 on the scheduled TDD SCell if the UL/DL configuration of the scheduled TDD SCell is configuration 0.
- Proposed agreement for UL cross carrier scheduling if the scheduling serving cell is TDD and the scheduled serving cell is FDD:
  - For UL cross-carrier scheduling where PHICH is transmitted on the scheduling serving cell, the scheduling/HARQ timing of FDD scheduled serving cell follows:
    - 10ms RTT
      - 4ms between UL grant/PHICH and PUSCH
      - 6ms between PUSCH and PHICH

Decision: The document is noted, modified as follows:

Agreements:
- For FDD Pcell case,.
  - For DL cross-carrier scheduling: agree on Alt DL-A
    - For DL cross-carrier scheduling with PUCCH on PCell-only, the DL HARQ timing of the scheduled serving cell follows the PCell's timing
  - For UL cross carrier scheduling if the scheduling serving cell is FDD and the scheduled serving cell is TDD:
    - For UL cross-carrier scheduling, the scheduling/HARQ timing of TDD scheduled serving cell follows the TDD scheduled serving cell's UL/DL configuration.
      - For eIMTA the TDD scheduled serving cell's UL/DL configuration is the SIB1 UL/DL configuration signaled by tdd-Config-r10
      - PHICH-less operation is carried out for the UL subframes corresponding to I_{PHICH}=1 on the scheduled TDD SCell if the UL/DL configuration of the scheduled TDD SCell is configuration 0
  - For UL cross carrier scheduling if the scheduling serving cell is TDD and the scheduled serving cell is FDD:
    - For UL cross-carrier scheduling, the scheduling/HARQ timing of FDD scheduled serving cell follows:
      - 10ms RTT
        - 4ms between UL grant/PHICH and PUSCH
        - 6ms between PUSCH and PHICH

Agreements:
- If TDD Pcell self-scheduling is supported, for TDD Pcell case,
  - For DL cross-carrier scheduling: agree on Alt DL-A
    - For DL cross-carrier scheduling with PUCCH on PCell-only, the DL HARQ timing of the scheduled serving cell follows the PCell's timing
    - PCell's timing is defined as:
      - DL HARQ timing determined according to the PCell's SIB1 UL/DL configuration, or DL-reference HARQ timing of the PCell for eIMTA
  - For UL cross carrier scheduling if the scheduling serving cell is FDD and the scheduled serving cell is TDD:
    - For UL cross-carrier scheduling, the scheduling/HARQ timing of TDD scheduled serving cell follows the TDD scheduled serving cell's UL/DL configuration.
      - For eIMTA the TDD scheduled serving cell's UL/DL configuration is the SIB1 UL/DL configuration signaled by tdd-Config-r10
      - PHICH-less operation is carried out for the UL subframes corresponding to I_{PHICH}=1 on the scheduled TDD SCell if the UL/DL configuration of the scheduled TDD SCell is configuration 0
  - For UL cross carrier scheduling if the scheduling serving cell is TDD and the scheduled serving cell is FDD:
    - For UL cross-carrier scheduling, the scheduling/HARQ timing of FDD scheduled serving cell follows:
      - 10ms RTT

- 4ms between UL grant/PHICH and PUSCH
- 6ms between PUSCH and PHICH

Friday 14th

R1-140974	WF on HARQ feedback for TDD FDD CA	Huawei, HiSilicon, CATT, Samsung, LGE, ZTE	

The document was presented by Fredrik Berggren from Huawei.
Discussion: Also supported by ITL.
Decision: The document is noted, modified and agreed with the following addition:

Agreements:

- For the FDD Pcell case, and for the TDD Pcell case if TDD Pcell is supported and if PUCCH format 1b with channel selection is applicable,
  - PUCCH format 1b with channel selection and PUCCH format 3 are supported for TDD-FDD carrier aggregation
  - For PUCCH format 1b with channel selection
    - When PCell is using FDD and SCell is using TDD
      - FDD ACK/NACK tables are used
    - When PCell is using TDD and SCell is using FDD
      - TDD ACK/NACK tables are used
  - For PUCCH format 1b with channel selection
    - When PCell is using FDD and SCell is using TDD
      - If there is an associated UL subframe on the SCell, PUCCH format 1a/1b is used as for a single FDD serving cell
      - Otherwise, PUCCH format 1b with channel selection is used
  - For PUCCH format 1b with channel selection and HARQ-ACK+SR transmission in the same subframe
    - When PCell is using FDD and SCell is using TDD
      - Joint HARQ-ACK and positive SR transmission is by PUCCH format 1a/1b
        - If there is an associated UL subframe on the SCell, transmission is performed as for a single FDD serving cell, i.e., spatial bundling is not performed on the SR resource.
        - Otherwise, transmission is performed as for two FDD serving cells, i.e., spatial bundling is performed on the SR resource.
    - When PCell is using TDD and SCell is using FDD
      - Joint HARQ-ACK and SR transmission is applied as for TDD carrier aggregation in Rel-10/11.
  - For HARQ-ACK transmission on PUCCH format 3 or on PUSCH
    - When PCell is using FDD and SCell is using TDD
      - The number of HARQ-ACK bits transmitted in an UL subframe is determined based on the number of serving cells that have an associated DL subframe and the downlink transmission modes configured for each serving cell.

R1-140960	Proposal on multiple TA for TDD FDD CA	LGE	

The document was presented by Joon Kui Ahn from LGE.

- Multiple TAGs can be configured between TDD cell and FDD cell
  - No additional handling is necessary to the current specifications to keep the maximum TX timing difference of 32.47us between the TDD cell and FDD cell
- Regarding support of single TAG across TDD cell and FDD cell, the following should be discussed
  - When TDD cell and FDD cell are in a PTAG
    - UE's TX subframe boundary between TDD cell and FDD cell can be aligned with no additional handling to the current specifications
  - When TDD cell and FDD cell are in a STAG
    - It should be clarified whether additional handling to the current specifications is necessary or not, to align the UE's TX subframe boundary between TDD cell and FDD cell

Decision: The document is noted, modified and the following is agreed

Agreements

- Multiple TAGs can be configured between TDD cell and FDD cell

  - No additional handling is necessary to the current specifications to keep the maximum TX timing difference of 32.47us between the TDD cell and FDD cell
- Regarding support of single TAG across TDD cell and FDD cell,
  - When TDD cell and FDD cell are in a PTAG
    - UE's TX subframe boundary between TDD cell and FDD cell can be aligned with no additional handling to the current specifications
  - When TDD cell and FDD cell are in a STAG
    - UE shall use NTA offset equals 624 Ts for the STAG

DCI format for TDD FDD CA

R1-140959	WF on DCI format for TDD FDD CA	LG Electronics, Nokia, NSN, ETRI, NTT DOCOMO	

Decision: The document is noted.

R1-141027	Proposal on DCI format for TDD-FDD CA	LGE	

The document was presented by Joon Kui Ahn from LGE and is an extension of R1-140959 for DCI format definition to cover full set of TDD-FDD CA combinations. Not co-sourced from other companies than LGE due to lack of time for check.

- DL/UL DCI format for PCell follows existing specification
- In DL/UL DCI for TDD/FDD SCell with FDD PCell and PUCCH on PCell-only
  - DL/UL DAI field does not exist
  - 3 bits HARQ process number field is used
- In DL/UL DCI for TDD/FDD Scell with TDD PCell and PUCCH on PCell-only
  - DL/UL DAI field is used for all TDD PCell UL/DL configurations
  - 4 bits HARQ process number field is used
- In UL DCI for TDD Scell
  - UL index field exists only for TDD Scell UL/DL configuration 0 (replacing UL DAI field if exists)
- In UL DCI for FDD Scell
  - No UL index field exists
- 1 bit SRS request field in DCI format 2B/2C/2D (if aperiodic SRS is configured) exists only when TDD SCell is a scheduled cell regardless whether the scheduling cell is TDD or FDD

Decision: The document is noted.

R1-141032	Way Forward on DCI Formats for TDD/FDD CA	Huawei, HiSilicon, ZTE	(R1-140978)

The document was presented by David Mazzarese from Huawei.

- When TDD/FDD CA is configured for a UE, DL/UL DCI formats for SCell include all TDD fields
  - Unused TDD fields are set to predefined value (e.g., 0) or reserved
  - The used TDD fields are according to the Table:

			UL DCI		**DL DCI**		
Pcell	**scheduling cell**	**scheduled cell**	**UL index**	**UL DAI**	**DL DAI**	**SRS request**	**HARQ process number**
Self-carrier scheduling							
FDD	self	TDD	UL index			1 bit	3 bits
FDD	self	FDD					
TDD	self	TDD					
TDD	self	FDD		UL DAI	DL DAI		4 bits
Cross-carrier scheduling							
FDD		TDD	UL index			1 bit	3 bits
FDD		FDD					3 bits
TDD		TDD	UL index	UL DAI	DL DAI	1 bit	4 bits
TDD		FDD		UL DAI	DL DAI		4 bits

Decision: The document is noted.

Agreement

- DL/UL DCI format for PCell follows existing specification

Remaining details are for email discussion/approval until Wed 19th February – (LGE), about the fields on DCI format to be needed for TDD-FDD CA.
After that email discussion/approval until 21th February about the DCI format design for TDD-FDD CA.

Email approval until 14th March about RRC parameter lists – (Nokia)

Not treated.

R1-140031	Remaining details for TDD-FDD CA	Huawei, HiSilicon	
R1-140032	Standard impact of TDD-FDD CA for UEs not supporting simultaneous transmission and reception	Huawei, HiSilicon	
R1-140033	Restriction on combinations of FDD/TDD serving cells for TDD-FDD CA	Huawei, HiSilicon	
R1-140082	PDSCH HARQ timing of FDD SCell with TDD as PCell	CATT	
R1-140083	UCI transmission for FDD-TDD carrier aggregation	CATT	
R1-140105	Half duplex UE operation for FDD-TDD CA	CATT	
R1-140159	Remaining issues on HARQ-ACK timing for TDD-FDD carrier aggregation	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140208	Remaining details for self-carrier scheduling when PCell is TDD	Huawei, HiSilicon	
R1-140215	Remaining issues on HARQ timing for TDD-FDD CA	ETRI	
R1-140229	On DCI/UCI transmission for TDD-FDD carrier aggregation	China Telecom	
R1-140230	On specification impact of HARQ design in TDD-FDD CA	China Telecom	
R1-140236	TDM UL transmission for TDD-FDD DL CA-capable UE with single transmitter	MediaTek Inc.	
R1-140310	DL HARQ timing for TDD-FDD carrier aggregation with self-carrier scheduling	LG Electronics	
R1-140311	HARQ timing for TDD-FDD carrier aggregation with cross-carrier scheduling	LG Electronics	
R1-140312	DCI for TDD-FDD carrier aggregation	LG Electronics	
R1-140313	UCI for TDD-FDD carrier aggregation	LG Electronics	
R1-140314	Timing advance for TDD-FDD carrier aggregation	LG Electronics	
R1-140359	DL HARQ timing for TDD-FDD CA	Samsung	
R1-140360	Specification impact in case of FDD Pcell for TDD-FDD CA	Samsung	
R1-140361	CSI feedback for TDD-FDD CA	Samsung	
R1-140362	SRS transmission for TDD-FDD CA	Samsung	
R1-140363	UL HARQ timing for TDD-FDD CA	Samsung	
R1-140364	Specification impact in case of TDD PCell for TDD-FDD CA	Samsung	
R1-140365	Multiple TA for TDD-FDD CA	Samsung	
R1-140411	On support of TDD-FDD Carrier Aggregation	Intel Corporation	
R1-140428	Self-scheduling PDSCH timing in TDD-FDD CA	Potevio	
R1-140429	Cross-scheduling timing in TDD-FDD CA	Potevio	
R1-140450	Solution for TDD-FDD CA	Qualcomm Inc.	
R1-140485	Remaining issues in TDD-FDD carrier aggregation system	NEC	
R1-140534	Further details on HARQ self-scheduling for TDD-FDD CA	Texas Instruments	
R1-140553	Handling of timing advance in TDD-FDD CA	Nokia, NSN	
R1-140554	Remaining details of TDD-FDD CA	Nokia, NSN	
R1-140591	Discussion on full/non-full duplex UE for TDD-FDD CA	CMCC	
R1-140597	Discussion on HARQ timing of PDSCH transmission with self-scheduling	CMCC	
R1-140598	Discussion on supporting of cross-carrier scheduling for TDD-FDD CA	CMCC	
R1-140618	Design of HARQ feedback for TDD-FDD CA	NTT DOCOMO	
R1-140619	Remaining issues on TDD-FDD CA	NTT DOCOMO	
R1-140642	DL HARQ-ACK for TDD-FDD CA with TDD Pcell	Sharp	
R1-140643	UL scheduling and HARQ-ACK feedback for cross-carrier scheduling	Sharp	
R1-140644	Support of non simultaneous Rx/Tx capable UEs for TDD-FDD carrier aggregation	Sharp	
R1-140668	DL HARQ timing of SCell for TDD-FDD CA	ITL Inc.	
R1-140670	View on DL HARQ timing for self-scheduling in TDD-FDD CA	KT Corp.	
R1-140671	View on cross-carrier scheduling in TDD-FDD CA	KT Corp.	

R1-140750	HARQ timing for self-scheduling	Ericsson	
R1-140751	DCI format design for TDD – FDD CA	Ericsson	
R1-140752	Cross-carrier scheduling support for TDD – FDD CA	Ericsson	
R1-140824	Remaining Issues for TDD-FDD CA	ZTE	(R1-140257)
R1-140957	WF on HARQ timing for TDD-FDD CA	LG Electronics, ETRI, NTT, NTT DOCOMO, Nokia, NSN, Samsung, ITL, Orange, NEC, I2R, KT Corp., Sharp, Telefonica, Kyocera, Hitachi	
R1-140978	Way Forward on DCI Formats for TDD/FDD CA	Huawei, HiSilicon, ZTE	

7.2.4 Small Cell Enhancements – Physical-layer Aspects

WID in RP-132073.

7.2.4.1 Higher order modulation

Mr Chair's recommendation: Specification of 256QAM in downlink transmission, with focus on MCS/CQI/TBS table design, while keeping existing size of CQI feedback field and MCS indication

R1-140034	CQI/MCS table design for 256QAM	Huawei, HiSilicon	

The document was presented by Ms Yuan Xia from Huawei and the proposals are summarized as follows.

Proposals for CQI table:

- The maximum efficiency for 256QAM CQI entry is 5.5547*8/6 = 7.4063;
- Introduce three new CQI entries for 256QAM
  - The efficiency corresponding to each entry is 6.1719, 6.7891, 7.4063
- CQI table for 256QAM should reserve some entries for low SNR region
  - Current CQI entries #0, #1 and #2 should be reserved
  - Current CQI entries #3, #5 and #7 can be removed
- The modulation order of CQI index 15 is changed to 256QAM
  - The spectral efficiency could be maintained to reduce impact on MCS/TBS table
- Other CQI entries should be remained unchanged

Proposals for MCS table:

- Introduce 8 MCS entries for 256QAM
  - 7 MCS entries (i.e., I_{TBS} #27~#33) reflect the corresponding efficiency or interpolated efficiency for the proposed CQI index #12-#15 for 256QAM.
  - 1 MCS entry for 256QAM retransmission
- 8 entries in Rel-8 MCS table should be dropped
  - 7 MCS entries (i.e., I_{TBS} #1, 3, 5, 7, 9, 9, 11) if the previous CQI entries #3,5,7 are dropped
  - 1 MCS entry (i.e., I_{TBS} #26) if the modulation order of CQI index #15 is changed to 256QAM
- Other MCS/TBS entries should be remained unchanged

Proposals for signalling: CQI/MCS table and/or 256QAM is configured by higher layer signalling per CC and transmission point

Discussion: CQI table indices concern from Intel (more efficient way may exist)

Decision: The document is noted.

R1-140555	On CQI/MCS/TBS table design for 256QAM	Nokia, NSN	

The document was presented by Klaus Hugl from Nokia and proposes:

Proposal 1: With fallback DCI Format 1A legacy MCS tables are used to ensure robust operation during reconfiguration.

Proposal 2 - Overall design principle: Base the new 256QAM MCS/CQI tables on the principle of reusing (most of the) existing entries and replace some low spectral efficiency values with the needed 256QAM entries. Extend the existing TBS table with some larger TBS sizes (I_TBS>26).

Proposal 3: Keep every other low spectral efficiency CQI/MCS entry of the existing tables to retain the ability to signal also CQI indication of several different low SINRs with the new tables, and enable additional legacy MCS fallback scheduling support.

Proposal 4: RAN1 should discuss the applicability of some other Rel. 8 table design principles for the new tables in order to free some additional table entries – including

- Support for reserved MCS values for modulation adaptation in the retransmission (for all or only some modulations)

- Need for overlapping spectral efficiency of different modulations (for all or only some modulations)

Decision: The document is noted.

R1-140753	CQI table design for downlink 256QAM	Ericsson	

The document was presented by Ms Yu Yang from Ericsson and proposes:

- Rel-8 CQI 2 should be retained to use TBS 0 for RRC/VoIP robustness.
- Down-sample the lower QPSK region to create spare CQI entries for the 256QAM region.
- Keep current CQI 5—13 unchanged to enable more compatible operations with current implementation.
- Introduce new CQI values to cover equal SNR spacing between Rel-8 CQI 14 rate and the highest 256QAM rate at 8*0.928.

Decision: The document is noted.

R1-140118	CQI/MCS/TBS Tables for 256QAM and Relevant Signalling	Intel Corporation	

The document was presented by Alexei Davydov from Intel and proposes:

Proposal 1: To form the new CQI table, replace several low MCSs of the legacy table with new 256QAM ones.

- Keep the lowest MCS in order to be safe in case the radio link suddenly becomes bad.
- Remove every other MCS rather than consecutive MCSs, which can help maintain a decent link adaptation capability in the low SNR regime.
- Make the CQI indices the same for the common MCSs between the legacy and the new CQI tables.

Proposal 2: To form the new MCS table, replace several low MCSs of the legacy table with new 256QAM ones.

- Keep the lowest MCS in order to be safe in case the radio link suddenly becomes bad.
- Remove every other MCS rather than consecutive MCSs to mitigate the impact of the disability that some low MCSs cannot be addressed in the new MCS table.
- Don't remove the MCS entries that directly come from the CQI entries as in the legacy MCS table design.
- Remove the higher modulation entry in each overlap region with the same TBS.
- Make the MCS indices the same for the common MCSs between the legacy and the new MCS tables.

Proposal 3: Both semi-static switching and dynamic switching between the legacy and the new CQI/MCS tables should be further studied.

Proposal 4: A new UE category for 256QAM should be defined in TS 36.306. Detailed values of the physical layer parameters for the new 256QAM UE category should be further discussed.

Proposal 5: Define a new RRC signaling indicating the total number of soft channel bits to be used for computing the soft buffer size.

Decision: The document is noted.

R1-140224	Higher Order Modulation for Small Cell Enhancement	HTC	

The document was presented by Richard Li from HTC and proposes:

- Proposal 1: Overlapping TBS indices in modulation and TBS index table is not required for small cells.
- Proposal 2: Switching point from 64QAM to 256QAM should be around code rate 0.65 as legacy switching point.

Decision: The document is noted.

Looking at WFs

R1-140876	WF on 256QAM design principles	Huawei, HiSilicon, Nokia, NSN, Ericsson, Blackberry, CATR	

The document was presented by Ms Yuan Xia from Huawei.

- CQI table
  - Support SE in the entire range from X1 bps/Hz to X2 bps/Hz
  - Down-sample low CQI entries by removing Y entries and add Y new entries for 256QAM region with even spacing
    - Reserve other Rel-8 entries
  - Switching point of 64QAM and 256QAM should be CQI Z (Z=14 or 15)
  - CQI should be ordered according to spectral efficiency
- MCS table
  - Definition of N (N=3 or 4) reserved entries for adaptive retransmission
  - MCS table design should ensure the support of all the VoIP TBS
  - The need of overlapping spectral efficiency of different modulations is FFS depending on whether there are sufficient MCS entries

- TBS table:
  - Reuse as many as possible of current TBS entries with up to around 2% in code rate deviation
  - Overhead assumption, M REs/PRB should be used for PDSCH
  - The new transport block sizes introduced in the specification should follow the Rel-8 principle of QPP size alignment

Discussion: ALU suggested to follow Rel-8 design principles.
Sony: Only link simulation results have been performed on down-sampling CQI, no system simulation results.
Decision: The document is noted.

Continue offline discussion until Thursday – (Huawei)
Possible agreements:

- CQI table
  - Support SE in the entire range from X1 bps/Hz to X2 bps/Hz
  - Down-sample low CQI entries by removing Y entries, and add Y new entries for 256QAM region with even spacing
    - Preserve other Rel-8 entries
  - CQI #0 to be equaled to out of range

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R1-140975	WF on 256QAM design principles	Huawei, HiSilicon, CATR, Ericsson, Intel, LGE	

The document was presented by Ms Xia Yuan from Huawei.

- CQI table
  - Support SE in the entire range from X1 bps/Hz to X2 bps/Hz
  - Down-sample low CQI entries by removing Y1 entries, and add Y1 new entries for 256QAM region with even spacing
    - Preserve other Rel-8 entries
  - CQI #0 to be equaled to out of range
  - Switching point of 64QAM and 256QAM should be CQI Z (Z=14 or 15 in the existing table)
  - FFS the positions of the CQI entries in the Rel-12 CQI table – decide between the following two options
    - Opt-1: order the CQI indices according to the spectral efficiencies
    - Opt-2: keep the CQI indices the same for the common CQIs between Rel-8 and Rel-12 CQI table
- Modulation and TBS index table
  - Definition of N (N=3 or 4) reserved entries for adaptive retransmission
  - Modulation and TBS table design should provide the support of all the VoIP TBS
  - The need of overlapping spectral efficiency of different modulations is FFS
- TBS table
  - Reuse as many as possible of current TBS entries with up to around 2% average padding
  - Define overhead assumption (REs/PRB) for PDSCH
  - The new transport block sizes introduced in the specification should follow the Rel-8 principle of QPP size alignment

Discussion: Nokia suggested going bullet by bullet and see what can be agreed.
Decision: The document is noted.

Agreement

- CQI table
  - Support SE in the entire range from X1 bps/Hz to X2 bps/Hz

Down-sample low CQI entries
Supported by Nokia, NSN, InterDigital, Huawei, HiSilicon, CATR, Ericsson, Intel, LGE, BlackBerry, ZTE, Broadcom, Fujitsu, Samsung, CATT, Motorola Mobility, Qualcomm, NVIDIA
Objected by Panasonic (other proposals may exist, testing impacts unclear), ALU (no hurry to agree on such principle at this stage), ASB
Huawei suggested removing "Preserve other Rel-8 entries" – fine to ALU
Panasonic → concern that specification change is high

R1-140503	CQI Reporting for 256QAM		Panasonic	

The document was presented by Michael Einhaus from Panasonic and suggests the following:

- Proposal 1: The reporting range for wideband CQI reporting should not be changed for 256QAM.

- Proposal 2: The combination of highest Rel-11 wideband CQI level and positive differential CQI values should be interpreted as CQI levels representing 256QAM.
- Proposal 3: The same CQI reporting range should be used for all configured CSI measurement sets.
- Proposal 4: Different CSI reporting process for the same serving cells should use the same CQI reporting range.
- Proposal 5: The CQI reporting range should be configured per serving cell in a UE specific manner.

Decision: The document is noted.

Agreement
- CQI table
  - Down-sample low CQI entries by removing Y1 entries, and add Y1 new entries for 256QAM region with even spacing
    - **Note:** One company (Panasonic) expressed a concern that tests and implied specification changes are unnecessary high

Agreements
- CQI table
  - CQI #0 to be equaled to out of range
  - Switching point of 64QAM and 256QAM should be CQI Z (Z=14 or 15 in the existing table)
  - FFS the positions of the CQI entries in the Rel-12 CQI table – decide between the following two options
    - Opt-1: order the CQI indices according to the spectral efficiencies
    - Opt-2: keep the CQI indices the same for the common CQIs between Rel-8 and Rel-12 CQI table

Modulation and TBS index table
Motorola → add FFS the position of Modulation and TBS entries in Rel-12 table
Panasonic → concern with the support of all VoIP TBS

Agreements
- Modulation and TBS index table
  - Definition of N (N=3 or 4) reserved entries for adaptive retransmission
  - Modulation and TBS table design should provide the support of all the VoIP TBS at least for Format 1A, FFS for Format 2x
  - The need of overlapping spectral efficiency of different modulations is FFS
  - FFS the position of Modulation and TBS entries in the Rel-12 Modulation and TBS table
- TBS table
  - Reuse as many as possible of current TBS entries with up to around [2%] average padding aligned with Rel-10 design
  - Define overhead assumption(s) (REs/PRB) for PDSCH
    - Working assumption: Use [120 REs] per PRB for all new spectral efficiencies except for the highest spectral efficiency
    - FFS: Overhead assumption for the highest spectral efficiency
  - The new transport block sizes introduced in the specification should follow the Rel-8 principle of QPP size alignment

R1-140867	WF on 256QAM configuration	LG Electronics, Qualcomm, InterDigital, Hitachi	

The document was presented by Ms Yunjung Yi from LGE.
- Use of 256QAM MCS/CQI table can be configured for each
  - configured CC
  - measurement subframe set
- In TM10
  - Use of 256QAM MCS table can be configured for the parameter set linked to each PQI field in DCI format 2D
  - Use of 256QAM CQI table can configured for each CSI process
- 256QAM is supported for all TMs
  - DCI 1A is scheduled based on legacy MCS/TBS table

Discussion: Also supported by ZTE.
Decision: The document is noted, modified and agreed as follows:

Agreements:

- Use of 256QAM MCS/CQI table can be configured for each configured CC
- 256QAM is supported for all TMs
  - Working assumption: 256QAM is supported at least for all DCI formats except for DCI format 1A and 1C, and FFS for DCI format 1A
- In TM10
  - FFS: Use of 256QAM MCS table can be configured for the parameter set linked to each PQI field in DCI format 2D
  - FFS: Use of 256QAM CQI table can configured for each CSI process

Not treated.

R1-140035	TBS table design for 256QAM	Huawei, HiSilicon	
R1-140036	Discussion on UE category with introduction of 256QAM	Huawei, HiSilicon	
R1-140084	Support of 256QAM in Rel-12	CATT	
R1-140160	Specification of 256QAM	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140258	On standard impacts of 256QAM in downlink	ZTE	
R1-140316	Support of 256QAM in various scenarios	LG Electronics	
R1-140317	CQI/MCS/TBS table design for 256QAM	LG Electronics	
R1-140366	Discussion on specification impacts of 256QAM	Samsung	
R1-140409	Discussion on standard impact of the 256QAM	Coolpad	
R1-140451	Higher order modulation	Qualcomm Inc.	
R1-140502	MCS Indication for 256QAM	Panasonic	
R1-140521	Evaluation and discussion on mechanism to support 256QAM	Hitachi Ltd	
R1-140535	Modulation mapping for 256QAM	Texas Instruments	
R1-140556	On operation of 256QAM with dynamic eNB power backoff	Nokia, NSN	
R1-140592	Discussion on UE category for 256QAM	CMCC	
R1-140593	CQI/ MCS/TBS table design for higher order modulation	CMCC	
R1-140608	Details of MCS and TBS design for high order modulation	Broadcom Corporation	
R1-140609	Details of CQI table and feedback design for high order modulation	Broadcom Corporation	
R1-140620	Design of CQI/MCS table for 256 QAM	NTT DOCOMO	
R1-140645	MCS signalling modifications for downlink 256QAM	NVIDIA	
R1-140650	Design considerations for 256-QAM	InterDigital	
R1-140663	Views on the specification of 256QAM	CATR	
R1-140675	On support of DL 256-QAM	Motorola Mobility	
R1-140754	MCS table design for downlink 256QAM	Ericsson	
R1-140755	TBS table design for downlink 256QAM	Ericsson	
R1-140756	On 256QAM UE category handling	Ericsson	

7.2.4.2 Small cell on/off and discovery

Mr Chair's recommendation: Solutions for reduced transition time of small cell on/off in single-carrier or multi-carrier operation, with enhanced discovery of small cells

Not treated.

R1-140757	Overview of small cell on/off and discovery signals	Ericsson	

7.2.4.2.1 Procedures for small cell on/off transition time reduction

R1-140037	Small cell on/off transition time reduction	Huawei, HiSilicon	

The document was presented by Weimin Xiao from Huawei and proposes:

- Enhanced RRC signalling to incorporate DRS-based measurement and synchronization;

Enhanced network-side signalling to incorporate small cell state changes;

- Scell (of CA) and SeNB (of dual connectivity) activation/deactivation procedures considering small cell on/off transition;
- Further improvements of the activation/deactivation configuration mechanisms for a group of UEs;

- Specifying UE monitoring behavior when its Scell/SeNB is deactivated.

Decision: The document is noted.

R1-140161	System design for transition time reduction and legacy UEs impacts for small cell ON/OFF	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Fang Chen Cheng from ALU and proposes:

- Proposal 1: Detection of UEs in the proximity of a dormant cell could be achieved by defining a new discovery procedure based on new discovery signals transmitted by the dormant cell, detection of UL signals by the dormant cell, or a combination of both.
- Proposal 2: New measurement event and measurement reporting mechanism based on new DL discovery signals need to be specified for small cell ON/OFF and cell switchover procedure.
- Proposal 3: New procedures of CSI-RS configuration, QCL, and CSI feedback for the dormant cell are specified for the preparation of turning on small cell and serve switchover from serving cell.
- Proposal 4: Procedures of turning on small cell, service switchover, and data forwarding should be performed concurrently to minimize the transition time.

Decision: The document is noted.

R1-140557	Procedures for small cell on/off transition time reduction	NSN, Nokia	

The document was presented by Timo Lunttila from NSN and proposes:

- Proposal #1: Further work on small cell ON/OFF shall assume semi-static time scales for small cell ON/OFF transitions.
- Proposal #2: Further small cell discovery related work in RAN1 shall focus on discovery signals, including related configuration and measurement aspects.

Decision: The document is noted.

R1-140452	Small cell on/off time reduction	Qualcomm Inc.	

The document was presented by Alex Damnjanovic from Qualcomm and proposes:

- Proposal 1: For CA scenario, Scell state indication is signalled on Pcell using DCI format 1C.
- Proposal 2: Signalled Scell state indication at subframe n-4 is valid for subframe n and all other subsequent subframes belonging to the same frame.
- Proposal 3: Lack of reception of DCI formant 1C with Scell state indication is interpreted as corresponding Scell being in off state.
- Proposal 4: For dual connectivity scenario, RRC signalling is utilized to indicate the state of Pcell_SCG.
- Proposal 5: Optimize PRACH based method to detect presence of UEs by eNBs in off state on Pcell (macro) layer. Alternatively, rely on SRS.

Decision: The document is noted.

R1-140669	Enhanced Small Cell on/off procedure for single-carrier and multiple-carrier operation	ITL Inc.	

The document was presented by … from ITL and proposes:

- Proposal 1: DCI format 3/3A/1C can be used to indicate the small cell on/off state to support the activation/deactivation of CA/ dual connectivity.
- Proposal 2: To reduce the transition time for synchronization in handover case, synchronization information such as slot number offset can included in the RRC configuration of the discovery signal.
- Proposal 3: To reduce the transition time of UL transmission, discovery signal based path loss estimation should be considered for the power control of initial UL transmission. The EPRE value of discovery signal should also be included in the RRC configuration of the discovery signal.

Decision: The document is noted.

R1-140758	On Small cell on/off and the New L1 procedure	Ericsson	

The document was presented by Ms Sorour Falahati from Ericsson and proposes:

- Small cell on/off is applicable only to cells that only serve CONNECTED mode UEs.
- A UE can be configured to receive the discovery signal
- When the UE is configured with a discovery signal from the serving cell it can rely only on the discovery signal for cell identification, measuring and deriving RRM and coarse time/frequency synchronization.
- A UE can be configured to receive reference signals to derive QCL properties for demodulation purposes.
    - The UE shall not rely on the presence of any other reference signal(s) for deriving QCL properties in any other subframes.

- The reference signals may be transmitted in a subframe containing discovery signals or on another subframe.
- For demodulation, the UE cannot rely on any reference signal(s) in any other subframe than the subframe in which it receives the corresponding physical channel.

Decision: The document is noted.

R1-140969	Way Forward on Small Cell On/Off Procedures	Huawei, HiSilicon	

The document was presented by Weimin Xiao from Huawei.

- Small cell with on/off does not serve idle UEs
- DRS-based measurements are supported
  - DRS-based RSRP and RSRQ
  - Incorporate the DRS-based measurements in handover and carrier aggregation activation/ deactivation procedures and dual connectivity defining in RAN2
    - FFS: support of SCG (Secondary Cell Group in dual connectivity) activation/deactivation
  - Specify UE monitoring behavior when DRS(s) is configured for a UE
  - FFS: potential impacts to DRX procedure
- FFS: Cell On/Off states explicitly informed to UE
- Send LS to RAN2 to start RAN2 work
- FFS: other new L1 procedure

Decision: The document is noted.

Agreements:

- No new idle mode UE behavior in Rel-12 small cell enh. WI
- For intra-/inter-freq. RRM measurement, at least DRS-based RSRP measurements are supported

Continue offline discussion until Thursday – Weimin (Huawei)

Possible agreements:

  - Use the DRS-based measurements as a first step of handover and carrier aggregation activation/ deactivation procedures
    - FFS: support of SCG (Secondary Cell Group in dual connectivity) activation/deactivation
  - Specify UE monitoring behavior when DRS(s) is configured for a UE
  - FFS: potential impacts to DRX procedure
- FFS: Cell On/Off states explicitly informed to UE
- Send LS to RAN2 to start RAN2 work
- FFS: other new L1 procedure

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R1-141016	Open issues of Small Cell on/off and discovery	Huawei, HiSilicon, Samsung, Fujitsu	

The document was presented by Weimin Xiao from Huawei.

- Whether (and how to) support DRS-based RSRQ-like measurements
- Potential RAN2 impacts to use the DRS-based measurements in handover, and carrier aggregation activation/deactivation, and dual connectivity procedure (being defined in RAN2)
- Investigate detailed solution(s) of new L1 procedure for activated Scell operating on/off that further reduces transition time
- Specify UE monitoring behavior when DRS(s) is configured for a UE, e.g.,
  - Whether DRS can be transmitted when cell is on
  - Under what condition(s) UE measurements are based on DRS, and/or CRS
- Whether (and how) cell On/Off states explicitly informed to UE
- Which other signal(s) the UE can assume are transmitted in addition to PSS for enhanced cell discovery
- Whether (and what) network assistance/information provided to UEs for performing enhanced cell discovery

It is proposed:

- For RRM measurements, support DRS-based RSRQ-like measurements
  - Details are FFS
- RAN2/3 impacts
  - RAN2 needs to define signaling of the configurations and assistant information (if supported) of DRS and DRS-based RRM measurement and reporting (including triggering mechanisms)
  - In addition, RAN1 has the impression that additional RAN2/3 impact to use the DRS-based measurements in handover, and carrier aggregation activation/deactivation is not significant if any. This needs RAN2/3 confirmation

- Dual connectivity procedures that are been defined in RAN2/3 also need to take into account the use of DRS-based RRM measurements

Decision: The document is noted.

Conclusion:

- Followings are open issues of small cell on/off and discovery to reduce the transition time
  - How to support DRS-based RSRQ-like measurements
  - Potential RAN2 impacts to use the DRS-based measurements in handover, and carrier aggregation activation/deactivation, and dual connectivity procedure (being defined in RAN2)
  - Investigate detailed solution(s) of new L1 procedure for activated Scell operating on/off that further reduces transition time
  - Specify UE monitoring behavior when DRS(s) is configured for a UE, e.g.,
    - Whether DRS can be transmitted when cell is on
    - Under what condition(s) UE measurements are based on DRS, and/or CRS
  - Whether (and how) cell On/Off states explicitly informed to UE
  - Which other signal(s) the UE can assume are transmitted in addition to PSS for enhanced cell discovery
  - Details of network assistance/information provided to UEs for performing enhanced cell discovery
  - Other aspects related small cell on/off and discovery include RLM, DRX are FFS

R1-141021	LS on small cell on/off and discovery	RAN1, Huawei	

The document was presented by Weimin Xiao from Huawei.
Decision: The document is noted and the LS is agreed.

Agreement:

- For RRM measurements, support DRS-based RSRQ-like measurements
  - Details are FFS

R1-141015	Way Forward on Transition Time Reduction for Small Cell On/Off	Ericsson, Qualcomm	

The document was presented by Havish Koorapaty from Ericsson.

- New procedures for transition time reduction should meet the following design targets
  - Transition time: A transition time between on/off states of less than one radio frame
  - On/off granularity: A minimum-on-time (after transition from off to on state) and a minimum-off-time (after transition from on to off state) restriction of not more than one radio frame
- Specification impacts should be identified

Decision: The document is noted and is for email discussion until 14th March – Havish (Ericsson)

Not treated.

R1-140038	Enhancements of RRM measurements for small cell on/off	Huawei, HiSilicon	
R1-140085	Discussion on procedures for small cell on/off with transition time reduction	CATT	
R1-140231	Enhanced procedure for small cell on/off	China Telecom	
R1-140244	On procedure enhancements for small cell fast on/off operation	MediaTek Inc.	
R1-140245	Performance evaluation for small cell on/off operation considering procedure and discovery/measurement enhancements	MediaTek Inc.	
R1-140285	Enhanced small cell on/off mechanisms	ZTE	
R1-140318	Efficient small cell on/off operation	LG Electronics	
R1-140367	Overview of small cell on/off scenarios and procedures	Samsung	
R1-140368	UE RRM and synchronization procedures with small cell on/off operation	Samsung	
R1-140504	Clarification on small cell on/off remaining issues	Panasonic	(R1-134374)
R1-140536	Necessary procedures for small cell on/off transition time reduction	Texas Instruments	
R1-140580	Small Cell On/Off Transition Time Reduction Using Fast Handover	CEWiT	

R1-140595	Discussion on small cell architectures and procedures for small cell on/off and discovery	CMCC	
R1-140621	Views on transition time reduction for small cell on/off	NTT DOCOMO	
R1-140676	Small cell on/off procedure	Motorola Mobility	
R1-140857	Comparison of methods for reduced on/off switching transition time	Hitachi Ltd	(R1-140522)

7.2.4.2.2 Discovery signal(s) and measurements

Focus on design criteria and specification of discovery signal(s) and measurements to start corresponding discussions at other WGs

R1-140558	On discovery signals and measurements	NSN, Nokia	

The document was presented by Timo Lunttila from NSN and proposes:

- Cell discovery is targeted for synchronized network and UEs in RRC_CONNECTED.
- Observation 1: The information contained in the UE report of discovered cells needs to be clarified.
- Further RAN1 studies on discovery signals shall focus on enhancing the discovery of dormant small cells based on bursty transmission of PSS/SSS and potentially CRS signals.
- Observation 2: Discovery signals' impact on legacy UEs' cell search and measurements requires further study.

Decision: The document is noted.

R1-140418	Small cell discovery enhancement	NEC	

The document was presented by … from NEC and draws the following observations:

- Observation 1: The guidance for discovery signal design is detection performance guarantee with less overhead.
- Observation 2: Enhancements of legacy PSS/SSS for cell discovery are needed.
- Observation 3: CSI-RS or PRS based scheme can provide best orthogonal property due to orthogonal time-frequency resources allocation; while code domain enhanced PSS/SSS scheme can also increase the detection probability.
- Observation 4: Code domain enhanced PSS/SSS scheme consumes less time-frequency resources, which is more desirable.
- Observation 5: Network side enhancement can guarantee performance for legacy UE with proper configuration.
- Observation 6: Signalling enhancement on the access link and backhaul are needed for network side enhancement schemes

Decision: The document is noted.

R1-140119	Discussion on small cell discovery and measurement	Intel Corporation	

The document was presented by Seunghee Han from Intel and concludes that PSS/SSS muting is a promising solution among the potential candidates considering the functions of time/frequency synchronization, UE implementation complexity/cost, UE power consumption, specification impact, detection performance, support of RRC_IDLE UEs, resource overhead, and processing time.

Decision: The document is noted.

R1-140371	Discussion on the detection timing of small cell discovery signal	Samsung	

The document was presented by … from Samsung and proposes the possible mechanisms to derive the detection timing of small cell discovery signals for RRC-CONNECTED UE as following:

- Option 1: The UE derives detection timing for discovery signal based on macro cell reception timing, TA for the macro cell and a timing offset ΔT.
- Option 2: The UE derives detection timing for discovery signal based on macro cell reception timing and a timing adjustment ΔT.
- Option 3: The UE derives detection timing for discovery signal based on PSS/SSS of any cell in the same small cell cluster.

Decision: The document is noted.

R1-140651	Measurement performance of Discovery Signals	InterDigital	

The document was presented by Paul Marinier from InterDigital and concludes

- Use of CRS-based RSRQ results in slightly better throughput performance than CSI-RS-based RSRQ (mostly for cell edge UE's) under the simulated scenario (2a) with small cell on/off enabled
- No conclusive effect is observed when comparing single-shot with averaged measurements for CSI-RS

Decision: The document is noted.

R1-140971	WF on Small Cell Discovery	NTT DOCOMO, Ericsson, Qualcomm, Huawei, HiSilicon	(R1-140968)

The document was presented by Hiroki Harada from NTT DoCoMo.

- In the enhanced cell discovery procedure, UE can assume multiple signals are transmitted for the purposes of coarse time/frequency synchronization, cell identification and RRM measurement and QCL (when necessary or possible depending on the procedure).
  - UE can assume transmission of PSS (identical to the Rel-8 waveform) at least for coarse time/frequency synchronization.
  - Which other signal(s) the UE can assume are transmitted is FFS.
    - Possible candidates are one or more instances of SSS, CRS, CSI-RS, and PRS.
    - Which signals are used for which purpose is FFS.
- In addition to purposes given by the WID, cell multiplexing capability, UE power efficiency, and impact to legacy UE's measurement should be considered when discussing candidate solutions
- Rel-12 discovery procedure is configured only for RRC_CONNECTED UEs.
- Network assistance is provided to UEs for performing enhanced cell discovery. The information provided includes at least rough timing (to be defined by RAN4) information of discovery signal(s)

Discussion: NTT DoCoMo → Suggestion to look at R1-140970.
Intel: What does rough timing mean?
Decision: The document is noted.

R1-140970	Timing uncertainty between assisting cell and on/off cell	Panasonic	

The document was presented by Suzuki Hidetoshi from Panasonic.

- Small cell on/off requires the condition that uncertainty of the timing is up to [2.5 or less] ms between assisting cell and on/off cell.
- FFS among following options.
  - Option1: small cell on/off support up to 2.5ms ~~synchronization~~uncertainty.
    - At least PSS is included in the discovery signal
  - Option2: small cell on/off support up to [CP length or UE's propagation delay measurement window] µs ~~synchronization~~uncertainty.
    - PSS may not be included in the discovery signal
  - Option 3: The network indicates option 1 condition or option 2 condition.

Discussion: ZTE → concern having such constraint on uncertainty
Decision: The document is noted.

Agreements:

- In the enhanced cell discovery procedure, UE can assume multiple signals are transmitted
  - UE can assume transmission of PSS (identical to the Rel-8 waveform) at least for coarse time synchronization
  - Which other signal(s) the UE can assume are transmitted is FFS
    - Possible candidates are one or more instances of SSS, CRS, CSI-RS, and PRS
    - Which signals are useful for which purpose is FFS
- In addition to purposes given by the WID, cell multiplexing capability, UE power efficiency, and impact to legacy UE's measurement can be considered when discussing candidate solutions
- Rel-12 discovery procedure is configured only for RRC_CONNECTED UEs
- FFS: Network assistance is provided to UEs for performing enhanced cell discovery. The information provided includes at least timing related information of discovery signal(s)

Continue offline discussion until Thursday – Hiroki (NTT DOCOMO)

Thursday 13th

R1-141017	WF on network assistance and discovery signal	NTT DOCOMO, Huawei, HiSilicon, Ericsson	

The document was presented by Hiroki Harada from NTT DoCoMo.

- Network assistance is provided to UEs when Rel-12 discovery procedure is configured. The information provided includes at least timing related information of discovery signals
  - FFS: Details of timing related information
    - Accuracy will be defined by RAN4
  - FFS: Other information provided

Discussion: ZTE → FFS network assistance has already been agreed in Wed session.

Decision: The document is noted, modified and agreed as follows:

Agreements:
- Network assistance related to at least timing associated with discovery measurement is provided to UEs for Rel-12 discovery procedure
  - It does not mean that DRS-based measurement reporting based on autonomous UE detection is precluded
  - Accuracy of timing considered for network assistance will be defined by RAN4
  - FFS: What is timing information associated with discovery measurement
  - FFS: Other information provided

Agreements:
- Followings can be considered as candidate signals for each purpose
  - For coarse time synchronization:
    - Candidate signals are PSS, PSS/SSS, PRS
  - For coarse frequency synchronization:
    - Candidate signals are PSS, PSS/SSS, CRS, CSI-RS, PRS
  - For cell/transmission point identification:
    - Candidate signals are PSS/SSS, CRS, CSI-RS, PRS
  - For RSRP measurement:
    - Candidate signals are PSS/SSS, CRS, CSI-RS, PRS
  - For received signal quality (RSRQ) measurement:
    - FFS: Whether RSSI can be measured by symbols including discovery signals or symbols not including discovery signals
  - For any of above purposes, Tx-side enhancement, e.g., muting and utilizing multiple instances, and/or Rx-side enhancement, e.g., interference cancellation, can be considered
  - UE can utilize a combination of discovery signals for any of above purposes

Agreements:
- In addition to evaluation assumptions in SI, following evaluation assumptions can be considered to down select candidate signals
  - Propagation delay between a cell and UE should be considered in the evaluations
  - At least top (3) small cell within Y dB RSRP gap should be detectable
    - Values of Y will be given in the evaluations
  - Initial time/frequency offsets are assumed within +/- 2.5ms and within +/- X ppm
    - Value of X will be given in the evaluations
  - For cell identification
    - The signal should be able to achieve over 90% detection probability for all detectable small cells
  - For RRM measurement
    - The signal should be able to achieve comparable RSRP measurement performance to legacy CRS-based RSRP for all detectable small cells

Not treated.

R1-140039	Discovery design options	Huawei, HiSilicon	
R1-140086	Discussion on small cell discovery	CATT	
R1-140162	Discovery signals and measurements for small cell on/off	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140191	Discussion on discovery and measurement for small cell on/off	Fujitsu	
R1-140202	Discovery signals features for energy-efficient small cell discovery and measurements	Huawei, HiSilicon	
R1-140213	Discovery signal design for small cell on/off	ETRI	
R1-140243	On detection rate requirement for small cell discovery	MediaTek Inc.	
R1-140286	Companion Discovery Signal (CDS) – Specification and Implementation Considerations	ZTE	
R1-140287	Companion Discovery Signal (CDS) – Operation for Small Cell ON/OFF	ZTE	
R1-140288	Discussion on timing acquisition for small cell discovery	ZTE	

R1-140319	Discussions on small cell discovery signal design	LG Electronics	
R1-140369	Discovery signal requirements for small cells	Samsung	
R1-140370	Discussion on discovery signal design aspects	Samsung	
R1-140410	Views on the small cell on/off	Coolpad	
R1-140453	Small cell discovery	Qualcomm Inc.	
R1-140487	Small cell discovery signal design	NEC	
R1-140537	Design criteria for discovery signal and measurements	Texas Instruments	
R1-140587	Considerations on RRM measurement for small cell on/off	Sony	
R1-140596	Small cell on/off and the design of discovery signal	CMCC	
R1-140610	Small cell discovery and measurements	Broadcom Corporation	
R1-140611	System level evaluations for synchronous discovery signal	Broadcom Corporation	
R1-140622	Views on discovery signal design for Rel-12 small cell enhancements	NTT DOCOMO	
R1-140759	On the design of discovery bursts and procedures	Ericsson	
R1-140831	Performance comparison of small cell discovery signal designs	MediaTek Inc.	(R1-140246)

7.2.4.3 Radio-interface based synchronization

Mr Chair's recommendation: Solutions for network listening in single-carrier or multi-carrier operation, to support multiple stratum level beyond 3 hops, e.g. 4 to 6 hops, to improve the achievable synchronization accuracy, and to be applicable to small cell on/off, eIMTA and inter-operator TDD deployment in the same band

R1-140594	Discussion on intra-operator and inter-operator synchronization for small cell enhancement	CMCC	

The document was presented by Xiaodong Shen from CMCC and is summarized as:
Considering intra-operator synchronization, it is proposed that:

- Proposal 1: Radio-interface based synchronization enhancement to support multiple stratum levels beyond 3 hops is necessary, and extending the existent backhaul signalling to support larger stratum levels could be considered as a starting point.
- Proposal 2: If the backhaul signalling for stratum levels is provided to the eNB, then explicit signalling which indicates RS configurations can be considered.
- Proposal 3: Several enhancements for the intra-operator synchronization need to be supported:
  - Support of the schemes to other small cell features, e.g., small cell on/off and eIMTA.
  - Support of the schemes to different vendors.
  - Support of the schemes to the TDD configuration 0.

Considering inter-operator synchronization, it is proposed that:

- Proposal 4: Inter-operator synchronization focuses on the scenarios that different TDD operators are co- deployed in the same band or adjacent band at the same region, including:
  - Synchronization between operator A's small cells to operator B's macro eNBs
  - Synchronization between different operators' small cells
  - Synchronization between different operators' macro eNBs
- Proposal 5: The TDD operator can provide its synchronization reference timing as the primary synchronization source for other TDD operators.
- Proposal 6: The TDD operator is able to hear from other TDD operators and to judge whether the target eNBs from another operator is synchronized to its own eNBs or not.

Decision: The document is noted.

R1-140040	On the support of multiple stratum levels in network listening	Huawei, HiSilicon	

The document was presented by Ms Elean Fan from Huawei and proposes:

- Applying implicit or explicit physical layer signalling to indicate synchronization stratum level.
- Indicating network listening RS resource by predefined resource allocation patterns and the target cell performs blind detection of the listening RS among the predefined patterns.

Discussion: LGE → concern with explicit physical layer signalling – how this can be done?
Decision: The document is noted.

R1-140623	On the specification support for RIBS	NTT DOCOMO	

The document was presented by … from NTT DoCoMo and proposes:

- Consider sending a LS to ask RAN3 if the following information elements can be added to the synchronization information elements specified in the RAN3 specifications.
  - Muting/listening pattern
  - Information to identify source cell
- Focus on typical NW listening scenarios. If a scenario is identified in which the Rel.12 RIBS is clearly not sufficient, consider further enhancement of RIBS in the future.

Decision: The document is noted.

Continue offline discussion until Thursday – (Huawei)

Thursday 13th

R1-140976	Proposal on network listening for RIBS	Huawei, HiSilicon, CATR, CMCC, BlackBerry, ETRI, CATT	

The document was presented by Ms Elean Fan from Huawei.

- Support listening among eNBs (at least small cells) of different TDD operators. FFS on the standard impacts.
- Both MBSFN subframes and GPs can be used for target cells to listen to the source cells. FFS on using UL subframes for target cells to listen to the source cells. FFS on the standard impacts.
- Support muting to improve the hearability for the scenario of small cells listening to small cells. Both MBSFN subframes and GPs can be used for muting. FFS on the standard impacts.
- Support not turning off listening RS in the source cell when small cell on/off is used in the network. FFS on the standard impacts.

Discussion: ALU → suggests to take the guidelines as working assumption – further work expected to investigate standard impacts.
Ericsson do not agree to have it as working assumption as a whole – agrees with "support muting to improve the hearability" and "support not turning off listening RS in the source cell when small cell on/off is used" but has concern with the other statements.
Decision: The document is noted.

Agreements:

- Support muting to improve the hearability for the scenario of small cells listening to small cells. FFS on the standard impacts.
- Support not turning off listening RS in the source cell when small cell on/off is used in the network. FFS on the standard impacts.

Not treated.

R1-140041	Solutions to improve the hearability of received RS for network listening	Huawei, HiSilicon	
R1-140042	Discussion on network listening with small cell on/off and eIMTA	Huawei, HiSilicon	
R1-140087	Radio-interface based synchronization for small cells	CATT	
R1-140163	System analysis of Network Listening	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140206	Discussion on network listening for inter-operator TDD deployment	Huawei, HiSilicon, CATR	
R1-140289	Source cell selection for network listening	ZTE	
R1-140290	Further consideration on RIBS	ZTE	
R1-140320	Design considerations on Radio-Interface Based network Synchronization	LG Electronics	
R1-140372	Discussion on radio-interface based synchronization solutions	Samsung	
R1-140559	Issues regarding Radio-Interface based Synchronization Design	NSN, Nokia	
R1-140760	On radio-interface based small cell synchronization	Ericsson	
R1-140828	Network synchronization by network listening	Qualcomm Inc.	(R1-140454)

7.2.4.4 Other

Not treated.

R1-140419	Views on interference coordination for semi-static small cell on/off	NEC	

7.2.5 Physical layer functionalities required for operation of Dual Connectivity

WID in RP-132069.
Chairman's recommendations: Note that the scope of this WI is the UEs supporting multiple Rx/Tx, RAN1 decisions for incoming LS (R2-134603) are also discussed.

R1-140866	WF of CC synchronization for Dual Connectivity	NTT DOCOMO, Deutsche Telekom, Orange, SoftBank Mobile, eAccess, KT Corp.	

The document was presented by Fred Takeda from NTT DoCoMo.
- Dual Connectivity should be specified to work under the assumption that frame timing and SFN are not always aligned across MeNB and SeNB.

Discussion: Also supported by Telecom Italia.
DoCoMo suggested adding "In case of CA, CCs are assumed to be synchronized as in Rel-10 and Rel-11 CA manner", because of operators 'concerns that CA is being considered for Dual Connectivity.
Qualcomm commented that consequences of unsynchronized frames have not been / should be evaluated before any decision. It can be agreed in principle and let RAN2 studying the consequences and decide upon.
Decision: The document is noted.

Possible working assumption
- Dual Connectivity should support the scenario where OFDM symbol and slot timing are not aligned across MeNB and SeNB.
- In case of CA, CCs are assumed to be synchronized as in Rel-10 and Rel-11 CA manner

LGE: FFS on the availability of the timing knowledge between MeNB and SeNB for small cell on/off operation.
Fujitsu: whatever RAN1 agrees as working assumption, both synchronized and unsynchronized still need to be considered – and spend more time discussing practical design issues.
Qualcomm agreed with Fujitsu's view.

New possible working assumption
- Dual Connectivity should support the scenario where OFDM symbol and slot timing are not aligned across MeNB and SeNB.
  - SFN-level alignment across MeNB and SeNB is up to RAN2 decision
- Note that it does not change the assumption of SCE WI

Support to include the note: Huawei, HiSilicon, NEC, NTT DoCoMo, Panasonic, Ericsson
Object to keep the note: ALU, ASB, Intel, ZTE, LGE, Samsung

Working assumption:
- Dual connectivity should support the scenarios where UE can assume the maximum received timing difference from MeNB and SeNB is 31.3 + X micro sec
  - Note: The value X is up to RAN4 decision on the potential requirements of synchronization accuracy between MeNB and SeNB
- Dual connectivity should support the scenarios where UE can not assume any maximum timing difference from MeNB and SeNB
- SFN-level alignment across MeNB and SeNB is up to RAN2 decision
- Prepare draft LS to RAN2/4 until Thursday – (NTT DOCOMO)

Thursday 13th

R1-141004	Draft LS on RAN1 working assumption on dual connectivity	NTT DoCoMo	R1-141005

The document was presented by Fred Takeda from NTT DoCoMo
Discussion: NEC → maximum received timing difference value is "30.26".
Decision: The document is noted and final LS is agreed in R1-141008.

R1-140088	RAN1 specification impact in support of dual connectivity	CATT	

The document was presented by Zukang Shen from CATT and list several areas with L1 impact to support dual connectivity.
Decision: The document is noted.

R1-140624	Open issues on dual connectivity	NTT DOCOMO	

The document was presented by Fred Takeda from NTT DoCoMo.

Decision: The document is noted.

R1-140232	Physical layer functionalities to support dual connectivity	China Telecom	

The document was presented by Huaming Wu from ZTE on behalf of China Telecom and proposes:

- Proposal 1: Common search space can be introduced in one SeNB cell for dual connectivity.
- Proposal 2: SR can be supported in SeNB.
- Proposal 3: PUCCH on SCell should be introduced in one SeNB cell and parallel PUCCH transmission in MeNB and SeNB should be supported for dual connectivity.
- Proposal 4: Separate power control should be supported for MeNB and SeNB for dual connectivity.
- Proposal 5: "primary SeNB cell" can be defined to support dual connectivity.

Decision: The document is noted.

R1-140523	Physical layer enhancement for Dual Connectivity	Hitachi Ltd	

The document was presented by … from Hitachi and proposes:

Proposal 1: One of serving cell in SeNB (special SeNB cell) should be configured for PUCCH transmission
- At least HARQ-ACK and CSI for SeNB cell(s) should be transmitted on the special SeNB cell
- SR need to be transmitted on the special SeNB cell

Proposal 2: Simultaneous PUCCH transmission on MeNB and SeNB should be supported.

Proposal 3: Separate open loop and closed loop power control should be supported for PUCCH on MeNB and SeNB
- Pathloss reference of PUCCH on special SeNB cell should be DL of special SeNB cell
- TPC command of PUCCH on SeNB should be transmitted on DCI on the SeNB cell
- New power scaling or prioritization mechanism needs to be specified for simultaneous PUCCH transmission on MeNB and SeNB

Proposal 4: If PUSCH is transmitted on MeNB (SeNB), the PUSCH should only include UCI (HARQ-ACK or periodic CSI) of the serving cell associated with MeNB (SeNB).

Proposal 5: Multiple aperiodic CSI requests should be allowed in a given subframe for MeNB and SeNB respectively.

Proposal 6: UE needs to monitor common search space (CSS) on special SeNB cell at least for the purpose of Msg2 reception, i.e. PDCCH and PDSCH configured by RA-RNTI.

Proposal 7: Parallel preamble transmissions need to be supported, or it can be up to UE implementation.

Decision: The document is noted.

R1-140455	Physical layer aspects of dual-connectivity	Qualcomm Inc.	

The document was presented by Alex Damnjanovic from Qualcomm and proposes:

- Proposal 1: Separate PUCCH configuration for PCell and the special Scell.
- Proposal 2: Separate power control for PUCCH on PCell and the special Scell.
- Proposal 3: UCI for SCG can be mapped to PUSCH on the cells belonging to SCG only.
- Proposal 4: TPC commands for the special Scell PUCCH are provided in the DL grants for the special Scell.
- Proposal 5: SCG common search space is configured for a UE on the special Scell carrying PUCCH.
- Proposal 6: MeNB and SeNB are synchronized at the level similar to the cell synchronization in Rel-11 CA.
- Proposal 7: For transmission on a subframe, the UE should be able to utilize any unused power from one eNB towards satisfying the power requirement of the second eNB.

Decision: The document is noted.

R1-140762	Power control on dual connectivity	Ericsson	

The document was presented by Daniel Larsson from Ericsson and proposes:

- Proposal 1: Reuse as much as possible carrier aggregation methodology and rules for power control for dual connectivity to prioritize UL channels and perform power scaling.
- Proposal 2: It is feasible to support parallel preamble transmissions for dual connectivity and how to handle parallel PRACH transmission in power limited case is left for FFS.
- Proposal 3: The UE reports PHRs separately to each cell and the corresponding PHR contains the PHR for all UL carriers the UE has configured.

Decision: The document is noted.

R1-140375	UL Power Control for Dual Connectivity	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes:

- Proposal 1: Power scaling methods, other than equal power scaling, should be considered for PUSCH transmissions to the MeNB and the SeNB under power limitation.

- Proposal 2: The MeNB configures to a UE a maximum power for transmissions to the MeNB, P_{CMAX_MeNB}, and a maximum power for transmissions to the SeNB, P_{CMAX_SeNB}.
- Proposal 3: No new PHR formats are introduced for DC. The PHR format is configured independently by each eNB. Triggering is independent for each eNB.

Decision: The document is noted.

R1-140954	WF on UCI for Dual Connectivity	InterDigital, Ericsson, Hitachi, NEC, Nokia, NSN, Qualcomm	

The document was presented by Paul Marinier from InterDigital.

- Uplink control information (UCI) related to the PDSCH/PUSCH operation in SCG is transmitted to the SeNB only
  - HARQ-ACK for PDSCH of SCG cells
  - Periodic and aperiodic CSI of SCG cells
  - Scheduling request (SR) of SCG (if agreed in RAN2)
- HARQ-ACK and CSI related to MCG is transmitted to the MeNB only
  - FFS for SR
- In SCG, UCI transmission rules are supported as in R11, with the Pcell replaced by the "special cell":
  - Physical channel (PUCCH or PUSCH) in which UCI is transmitted
    - Selection of the cell in which UCI is transmitted in case of UCI on PUSCH
    - Selection of PUCCH resources for HARQ-ACK
  - Periodic CSI dropping rules
  - Handling of UCI combinations
  - HARQ-ACK timing and multiplexing, if simultaneous PUCCH (MeNB) -PUCCH (SeNB) is supported

Decision: The document is noted, modified and agreed as:

Agreements:

- At least following schemes are supported
  - At least the following, uplink control information (UCI) related to the PDSCH/PUSCH operation in SCG is transmitted to the SeNB only
    - HARQ-ACK for PDSCH of SCG cells
    - Periodic and aperiodic CSI of SCG cells
  - HARQ-ACK and CSI related to MCG is transmitted to the MeNB only
  - In SCG, the UCI transmission rules as in Rel-11 are supported, with the Pcell replaced by the pSCell:
    - Physical channel (PUCCH or PUSCH) in which UCI is transmitted
      - Selection of the cell in which UCI is transmitted in case of UCI on PUSCH
      - Selection of PUCCH resources for HARQ-ACK
    - Periodic CSI dropping rules
    - Handling of UCI combinations
    - HARQ-ACK timing and multiplexing

Not treated.

R1-140043	Physical layer impact of Dual connectivity - Downlink	Huawei, HiSilicon	
R1-140044	Physical layer impact of Dual connectivity - Uplink	Huawei, HiSilicon	
R1-140089	PUCCH enhancements for dual connectivity	CATT	
R1-140120	Physical layer impact on dual connectivity	Intel Corporation	
R1-140164	UCI transmission for dual connectivity and PUCCH resource allocation	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140165	UL power control and power scaling for dual connectivity	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140192	Physical layer issues of dual connectivity	Fujitsu	
R1-140193	Power allocation strategy for power limited UE in dual-connectivity	Fujitsu	
R1-140214	Physical layers functionalities to support dual connectivity operation	ETRI	
R1-140259	Physical layer functionalities for Dual Connectivity	ZTE	
R1-140321	Physical layer aspect of dual connectivity	LG Electronics	

R1-140373	Parallel random access preamble transmissions in dual connectivity	Samsung	
R1-140374	Physical layer specification impacts of dual connectivity	Samsung	
R1-140376	Prioritization of UL Information Types for Dual Connectivity	Samsung	
R1-140377	UE Capability for Dual Connectivity	Samsung	
R1-140420	On UE capabilities defined as UE category for dual connectivity	NEC	
R1-140488	On separate PUCCH and RA procedure for SeNB in dual connectivity	NEC	
R1-140524	PHY functionalities for dual connectivity	Hitachi Ltd	
R1-140538	Physical layer support for Dual Connectivity	Texas Instruments	
R1-140560	Discussion on the LS on random access in dual connectivity	Nokia, NSN	
R1-140561	UL power control aspects of dual connectivity	NSN, Nokia	
R1-140625	Views on open issues on dual connectivity	NTT DOCOMO	
R1-140652	Physical layer functionalities for Dual Connectivity	InterDigital	
R1-140659	Power scaling in Dual Connectivity	InterDigital	
R1-140761	Physical layer aspects of dual connectivity	Ericsson	
R1-140855	Common search space on SeNB for dual connectivity	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	(R1-140167)

7.2.6 Inter-eNB CoMP for LTE

WID in RP-132103.
Mr Chair's recommendation: Identification of information for which signalling is to be specified by RAN3.

R1-141012	Summary of Ad-hoc session on Inter-eNB CoMP for LTE	Ad-Hoc Chairman (Alcatel Lucent)	

The document was presented by Matthew Baker from ALU and shows the outcomes of the different CoMP sessions.
Decision: The document is endorsed and incorporated below with the following updates.

Tuesday morning session

R1-140045	Inter-eNB information for supporting CoMP with non-ideal backhaul	Huawei, HiSilicon	

Decision: The document is noted.

R1-140763	Signalling Needs for Non-Ideal Backhaul CoMP	Ericsson	

Decision: The document is noted.

R1-140563	Inter-eNB signalling design to support coordinated muting	NSN, Nokia	

Decision: The document is noted.

R1-140090	Discussion on identification of information for inter-eNB CoMP signalling	CATT	

Decision: The document is noted.

R1-140378	Signalling for inter-eNB CoMP operation	Samsung	

Decision: The document is noted.

R1-140379	Use of SRS received power for inter-eNB CoMP	Samsung	

Decision: The document is noted.

R1-140168	Proposed signalling information for supporting eCoMP with NIB	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-140264	Signalling for inter-eNB CoMP	ZTE	

Decision: The document is noted.

R1-140510	Analysis and proposals for the enhancement of X2 signalling	IAESI, DAC-UPC	

Decision: The document is noted.

R1-140456	Parameters for backhaul signalling	Qualcomm Inc.	

Decision: The document is noted.

R1-140875	WF on Signalling for Inter-eNB CoMP	Samsung, CATT, CMCC, China Telecom, Deutsche Telekom, SK Telecom, ZTE	

Decision: The document is noted. Also supported by China Unicom and Qualcomm
Proposal:

- In order to realize both centralized and distributed coordination in terms of inter-eNB CoMP, at least the following signalling of information should be specified:
  - One or more sets of CSI reports (RI, PMI, CQI) of a set of UEs
  - One or more measurement reports (RSRP) of a set of UEs
  - SRS received power of a set of UEs
  - Indication of resource coordination result
    - Resource allocation [i.e. one node tells an eNB to use / not to use certain resources] in time/frequency/spatial domain
      - FFS what the behaviour of the receiving eNB is
        - QC: at least send back yes or no
  - Used configurations or coordination request of SRS, CSI-RS, DMRS, CSI processes and CSI-IM
  - Indication of coordination result for SRS, ZP CSI-RS, DMRS, CSI processes and CSI-IM configurations

R1-140877	WF on CoMP-NIB signalling	LG Electronics, Ericsson, Huawei, HiSilicon, NSN, Nokia	

Decision: The document is noted.
Proposal:

- A *benefit metric* for a cell corresponding to a *CoMP hypothesis* can be signaled between eNBs to facilitate CoMP with non-ideal backhaul.
  - A benefit metric for a cell corresponds to a CoMP hypothesis and is associated with a frequency/time resource.
  - The benefit metric for a cell represents the quantified benefit that the cell of the sender eNB expects in its scheduling when a corresponding CoMP hypothesis is assumed at the associated frequency/time resource.
    - Note: How to react to a received benefit metric signaling is up to receiver eNB's implementation.
  - An associated CoMP hypothesis can correspond to, e.g.,
    - Power allocations (including muting) for cell(s)
- *Enhanced RNTP* can be separately signaled between eNBs to facilitate CoMP.
  - Enhanced RNTP can be used to coordinate PDSCH
    - Coordination of EPDCCH may also be considered
  - Information granularity of the *Enhanced RNTP* is extended to the frequency/time domain.
  - Information in the *Enhanced RNTP* is (optionally multi-level) transmit power threshold for only the sender eNB.
  - Possible enhancement on existing *Status report*, which can be signaled between eNBs to exchange the usage status of the indicated frequency/time resources

Possible way forward for further discussion until Thur:

- At least the following signalling is provided from one node to an eNB (additional other items not precluded - FFS):
  - A *CoMP hypothesis* comprising a hypothetical resource allocation at at least the receiving eNB (e.g. in time/frequency/spatial domains)
  - A *benefit metric* (definition FFS) associated with the CoMP hypothesis, quantifying the benefit if the receiving eNB implements (its part of) the CoMP hypothesis
    - Note: How to react to a received benefit metric signaling is up to receiving eNB's implementation.
    - FFS whether the receiving eNB can send back a response e.g. "yes/no" to the sending node.
- At least the following signalling is also provided from one node to another:
  - One or more sets of CSI reports (RI, PMI, CQI) of a set of UEs

Work on a converged proposal (e.g. starting from the above) until Thur.
Continue discussion on either Thur pm or Fri.

Thursday 13th

R1-140973	WF on CoMP-NIB signaling enhancements	LG Electronics, Ericsson, Fujitsu, Huawei, HiSilicon, Hitachi, IAESI, NSN, Nokia	

Decision: The document is noted.

Proposal:
- *Enhanced RNTP* can be signaled between eNBs to facilitate CoMP.
  - Enhanced RNTP can be used to coordinate PDSCH
    - Coordination of EPDCCH may also be considered
  - Information granularity of the *Enhanced RNTP* is extended to the frequency/time domain
  - Information in the *Enhanced RNTP* is (optionally multi-level) transmit power threshold for only the sender eNB.
  - Possible enhancement on existing *Status report*, which can be signaled between eNBs to exchange the usage status of the indicated frequency/time resources
- If additional signaling is to be considered (e.g., benefit metric), further discussion is needed.

R1-141006	WF on Signalling for Inter-eNB CoMP	Samsung, CATT, CMCC, China Telecom, China Unicom, Deutsche Telekom, ETRI, KDDI, Qualcomm, SK Telecom, Telecom Italia, ZTE	(R1-140875)

Decision: The document is noted.

Proposal:
- In order to realize both centralized and distributed coordination in terms of inter-eNB CoMP, at least the following signalling of information should be specified:
  - At least the following signalling is provided from one node to another:
    - A *CoMP hypothesis* comprising a hypothetical resource allocation at at least the receiving node (e.g. in time/frequency/spatial domains)
    - A *benefit metric* (definition FFS) associated with the CoMP hypothesis, quantifying the benefit if the receiving node implements (its part of) the CoMP hypothesis
      - Note: How to react to a received benefit metric signaling is up to receiving node's implementation.
      - The receiving node can send back a response e.g. "yes/no" to the sending node.
    - One or more sets of CSI reports (RI, PMI, CQI) of a set of UEs
    - One or more measurement reports (RSRP) of a set of UEs
    - SRS received power of a set of UEs
    - Used configurations or coordination request of SRS, CSI-RS, DMRS, CSI processes and CSI-IM
    - Indication of coordination result for SRS, ZP CSI-RS, DMRS, CSI processes and CSI-IM configurations

Proposal:
- *Enhanced RNTP* can be signaled between eNBs to facilitate CoMP.
  - Enhanced RNTP can be used to coordinate PDSCH
    - Coordination of EPDCCH may also be considered
  - Information granularity of the *Enhanced RNTP* is extended to the frequency/time domain
  - Information in the *Enhanced RNTP* is (optionally multi-level) transmit power threshold for only the sender eNB.
  - Possible enhancement on existing *Status report*, which can be signaled between eNBs to exchange the usage status of the indicated frequency/time resources
- A hypothetical resource allocation at at least the receiving node (e.g. in time/frequency/spatial domains)
- One or more sets of CSI reports (RI, PMI, CQI) of a set of UEs
- One or more measurement reports (RSRP) of a set of UEs
- Further discussion is needed if additional signaling is to be considered, e.g.:
  - Per cell benefit metric

Proposal:

- A hypothetical resource allocation at at least the receiving node (e.g. in time/frequency/spatial domains)
  - The receiving node can send back a response e.g. "yes/no" to the sending node.
- One or more measurement reports (RSRP) of a set of UEs
- Further discussion is needed if additional signaling is to be considered

Supported by: Qualcomm, Samsung, ZTE, Deutsche Telecom, CMCC, CATT
Objections: NSN, IAESI, Ericsson, Huawei

Proposal:
- *Enhanced RNTP* can be signaled between eNBs to facilitate CoMP.
  - Enhanced RNTP can be used to coordinate PDSCH
    - Coordination of EPDCCH may also be considered
  - Information granularity of the *Enhanced RNTP* is extended to the frequency/time domain
  - Information in the *Enhanced RNTP* is (optionally multi-level) transmit power threshold for only the sender eNB.
  - Possible enhancement on existing *Status report*, which can be signaled between eNBs to exchange the usage status of the indicated frequency/time resources

Supported by: NSN, Ericsson, Hitachi, Huawei, IAESI, LGE
Objections: Samsung, ZTE, CATT, ALU

Conclusion:
Send an LS to RAN3 cc RAN - R1-140951 (Samsung):
"RAN1 has not yet been able to identify any common denominator among the different proposals for signalling information for inter-eNB CoMP."

Friday 14th

R1-140951	[draft] LS on Inter-eNB CoMP for LTE	Samsung	R1-141048

Decision: The document is noted and final LS is agreed in R1-141048.

Not treated.

R1-140121	Discussion on backhaul link signalling for downlink CoMP	Intel Corporation	
R1-140322	Backhaul signalling design considerations for CoMP with NIB	LG Electronics	
R1-140323	Further evaluation for DL CoMP with NIB	LG Electronics	
R1-140380	Performance comparison between inter-eNB CoMP schemes in SCE scenario 2a	Samsung	
R1-140381	Performance comparison between inter-eNB CoMP schemes in CoMP scenario 2	Samsung	
R1-140421	Signalling Considerations for CoMP with non ideal backhaul	NEC	
R1-140525	CoMP Signalling with Non-Ideal Backhaul	Hitachi Ltd	
R1-140539	On signalling for inter-eNB CoMP	Texas Instruments	
R1-140562	Discussion on architectures supporting inter-eNB CoMP	NSN, Nokia	
R1-140564	Inter-eNB Signalling for EPDCCH Coordination	NSN, Nokia	
R1-140601	General views on backhaul signalling for CoMP-NIB	CMCC	
R1-140604	Partial Measurement Reports Exchange for CoMP-NIB	CMCC	
R1-140626	Details on Backhaul Signalling for Inter-eNB CoMP	NTT DOCOMO	

7.2.7 Study on 3D-channel model for Elevation Beamforming and FD-MIMO

SID in RP-130811.

R1-141013	Summary of Ad-hoc session on 3D-channel model for Elevation Beamforming and FD-MIMO	Ad-Hoc Chairman (Qualcomm)	

The document was presented by Wanchi Chen from Qualcomm and reports the outcomes of the 3D ad-hoc session.
Decision: The document is noted.

R1-140565	TP for 36.873	NSN, Nokia	

Decision: The document is noted.
- For mode 2, add a note that $(\theta', \phi') = (\theta'', \phi'')$
- Right after equation (20), update N(□,□) to N(□□□□)

The TP is endorsed with the above two updates.
Email discussion until 21/2/2014 to incorporate additional agreements of this meeting to the TR – (NSN)

7.2.7.1 Remaining details of fast fading modelling for 3D-UMa and 3D-UMi

R1-140091	Clarification on fast fading modelling for 3D-UMa and 3D-UMi	CATT	

Decision: The document is noted.

Conclusion:
- Taking O-to-I LOS as NLOS case in fast fading generation
  - P_n without LOS component is used when determining two strongest clusters,
  - P_n with LOS component is used when calculating the angle spreads
  - To clarify the first bullet in 36.873

R1-140324	Discussion on UE-side orientation and antenna pattern	LG Electronics	

Decision: The document is noted.

Agreement:
- Confirm the following working assumptions
- For distributions on UE orientation angles, $\Omega_{UT,\square\square}$ uniformly distributed on [0,360] degree, $\Omega_{UT,\square}$ = 90 degree, $\Omega_{UT,\square}$ = 0 degree are used for calibration and baseline performance evaluations
- For UE antenna gain pattern in local coordinate systems, isotropic antenna gain pattern $A'(\theta',\phi')$ = 1 is used for calibration and baseline performance evaluations

R1-140849	Some investigations on angular sampling method for 3D spatial cluster	Anite Telecoms Ltd.	(R1-140805)

Decision: The document is noted.

Not treated.

R1-140967	WF on UE-side assumptions for 3D channel model	LG Electronics, Fraunhofer, ETRI, Anite	

7.2.7.2 Remaining simulation assumptions for channel model calibration / baseline

R1-140961	Discussion on wrapping method for 3D channel model	Huawei, HiSilicon	(R1-140046)

Decision: The document is noted.

R1-140842	Discussions on Wrapping Methodology	Ericsson	(R1-140764)

Decision: The document is noted.

Agreement:
- For each of the geographical and radio based wrapping methods, a reference describing the methods is provided in the TR, Section 8, where the RSRP formula is.
- For calibration and baseline simulations:
  - Both geographical and radio based simulations results are included in the TR
    - Geographical based wrapping is mandatory, while radio based wrapping is optional (companies are strongly encouraged to provide results for both methods)
- Bishwarup to include reference R1-140842 for each of the wrapping method
- For the wrapping method, different large scale maps are used for each of the wrapping candidate.

R1-140092	Clarification on simulation assumptions for channel model calibration / baseline	CATT	

Decision: The document is noted.

Agreement:
- The definition of ZSD/ZSA is based on the CAS defined in 25.996, and the definition of ZSD/ZSA should be defined in the TR

- For $P_{n,m}$, it assumes the omni-antenna pattern

- The above should be captured in the TR
- For the case of K=1, The 4 antenna ports are mapped such that [0, 2; 1, 3]
- For the case of K =10, the 4 antenna ports are mapped such that [0, 2, 1, 3];
  - Where 0/1 are -45 degree
- Capture the above in the TR

Not treated.

R1-140325	Discussion on geographical distance and radio distance based wrapping	LG Electronics	
R1-140489	Discussion on additional Phase2 calibration statistics	NEC	
R1-140653	Remaining Issues on UE Attachment	InterDigital	
R1-140765	Polarized Antenna Modelling	Ericsson	

7.2.7.3 Phase 1 and Phase 2 calibration results

R1-140843	Summary of Phase 1 and Phase 2 calibration results from [75-29]	NSN, Nokia	(R1-140566)

Decision: The document is noted.

Conclusion:

- Phase 1 calibration is completed. Bishwarup to capture the phase 1 calibration results in the TR
  - Simulation assumptions and the mean CDF curves
- For Phase 2 calibration results, companies are encouraged to further update phase 2 calibration results (via email submission until 28/2/2014) - NSN
  - Adding coupling loss in phase 2 calibration results

Not treated.

R1-140093	Phase 1 calibration results for 3D channel modelling	CATT	
R1-140122	Phase one calibration results for 3D channel model	Intel Corporation	
R1-140123	Phase two calibration results for 3D channel model	Intel Corporation	
R1-140169	Phase 1 and Phase 2 Channel Calibration results for 3D UMa and 3D UMi	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140282	Phase 1 and Phase 2 calibration results of 3D Channel	ZTE	
R1-140326	Evaluation results for phase 1 and phase 2 calibration	LG Electronics	
R1-140382	Phase-1 calibration results	Samsung	
R1-140422	Phase-2 calibration results for fast fading parameters	NEC	
R1-140459	Phase 1 and Phase 2 calibration results	Qualcomm Inc.	
R1-140526	3D UMa/UMi Phase 1 Calibration Results	Hitachi Ltd	
R1-140602	Updated Phase 1 calibration results for 3D-UMa and 3D-Umi	CMCC	
R1-140603	Phase 2 calibration results for 3D-UMa and 3D-Umi	CMCC	
R1-140660	Phase 1 calibration results of 3D MIMO	CATR	
R1-140766	Calibration Results	Ericsson	
R1-140830	Initial calibration results for 3D channel modelling	Fujitsu	(R1-140194)
R1-140844	Phase 1 and Phase 2 calibration results	NSN, Nokia	(R1-140567)
R1-140850	Phase 1 and 2 Calibration Results for 3D Channel Model	InterDigital	(R1-140654)
R1-140858	3D UMa Phase 2 Calibration Results	Hitachi Ltd	(R1-140527)
R1-140874	Phase 2 calibration results for 3D channel modelling	CATT	(R1-140094)
R1-140932	Phase 1/2 Calibration Results for 3D-Channel Model	NTT DOCOMO	(R1-140627)
R1-140962	Phase 1 calibration results for 3D channel model	Huawei, HiSilicon	(R1-140047)
R1-140963	Phase 2 calibration results for 3D channel model	Huawei, HiSilicon	(R1-140048)
R1-140966	Phase-2 calibration results	Samsung	(R1-140383)

7.2.7.4 Initial baseline results

R1-140845	Summary of Initial baseline results from [75-29]	NSN, Nokia	(R1-140568)

Decision: The document is noted.

Conclusion:

- For baseline results, companies are encouraged to further update baseline simulation results (via email submission until 28/2/2014) - NSN

Not treated.

R1-140095	Initial baseline results for 3D channel modelling	CATT	
R1-140124	Initial baseline calibration results for 3D channel model	Intel Corporation	
R1-140170	Initial baseline performance for 3D UMa and 3D UMi	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140283	Initial baseline results of 3D Channel	ZTE	
R1-140327	Initial throughput results for baseline performance	LG Electronics	
R1-140384	Calibration results for baseline evaluation	Samsung	
R1-140423	Baseline performance results	NEC	
R1-140460	Initial baseline results	Qualcomm Inc.	
R1-140528	3D UMa Initial Baseline Results	Hitachi Ltd	
R1-140605	Initial baseline performance evaluation results	CMCC	
R1-140767	Baseline Performance Results	Ericsson	
R1-140846	Initial baseline results	NSN, Nokia	(R1-140569)
R1-140851	Initial Baseline Results for 3D Channel Model	InterDigital	(R1-140655)
R1-140964	Baseline performance evaluation results	Huawei, HiSilicon	(R1-140049)

7.2.7.5 Details of 3D UMa with one high rise per sector with 300m ISD

R1-140599	Summary of email discussion [75-14]: High-rise scenario for 3D-channel	CMCC	

Decision: The document is noted.

R1-140972	WF on Channel Modeling for High Rise Scenario	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATR, CATT, CHTTL, CMCC, Huawei, HiSilicon, Hitachi, INTEL, LGE, NEC, NTT DoCoMo, Samsung, ZTE	

Decision: The document is noted.

Continue discussion

R1-140204	Details of channel modelling for high rise scenario	Huawei, HiSilicon	

Decision: The document is noted.

R1-140768	LOS/NLOS Determination for the High-Rise Scenario	Ericsson	

Decision: The document is noted.

Not treated.

R1-140125	UE movement in high rise scenario	Intel Corporation	
R1-140171	Channel modelling details for the high-rise 3D UMa scenario	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140195	Details of 3D UMa with one high rise per sector with 300m ISD	Fujitsu	
R1-140284	Discussion on channel model for high rise scenario	ZTE	
R1-140328	Discussion on channel modelling for 3D UMa high rise scenario	LG Electronics	
R1-140385	Discussions on high-rise scenario	Samsung	
R1-140461	Details of 3D UMa with one high rise per sector	Qualcomm Inc.	
R1-140529	Details of 3D UMa with One High Rise per Sector	Hitachi Ltd	
R1-140570	Details of 3D UMa with one high rise per sector with 300m ISD	NSN, Nokia	

R1-140600	Measurement and Discussions on Small Scale Parameters for High Rise Scenario	CMCC	
R1-140606	Discussion on NLoS PL based on Ray Tracing	CMCC	
R1-140628	Views on 3D UMa with one high-rise per sector with 300m ISD	NTT DOCOMO	
R1-140769	Scatterer Modelling for the High-Rise Scenario	Ericsson	
R1-140770	Modelling Considerations for the High-Rise Scenario	Ericsson	

7.2.7.6 Other

Not treated.

R1-140126	Potential performance improvement in FD-MIMO systems	Intel Corporation	

7.2.8 Study on LTE Device to Device Proximity Services

SID in RP-122009.

R1-141014	Summary of Ad-hoc session on Study on LTE Device to Device Proximity Services	Ad-Hoc Chairman (Alcatel Lucent)	

The document was presented by Matthew Baker from ALU and shows the outcomes of the different D2D sessions.
Decision: The document is endorsed and incorporated below.

R1-140771	Overview of D2D functions and standardization impact	Ericsson	
R1-140772	Design Principles for Network Control of D2D Transmission	Telecom Italia, Ericsson	

7.2.8.1 D2D communication

Mr Chair's recommendations: Focus on broadcast D2D communication for the public safety use case, on the understanding that basic groupcast and relay functionality (for network-UE relay case) are supported by broadcast D2D communication.
If possible, consider optimisations to enhance efficiency of the relay operation.
Note that impact to existing operator services and resources is included in the evaluations.

7.2.8.1.1 Synchronization design

Remaining aspects of procedure, and details of D2DSS and possible PD2DSCH, including any relevant evaluations.

Procedure

R1-140899	WF on Timing Synchronization of D2D Broadcast	Samsung, Intel, Nokia, III	

Decision: The document is noted.

Working Assumption:
Synchronization sources which are UEs within network coverage have a higher priority than synchronization sources which are UEs outside network coverage

R1-140937	Way Forward on D2D synchronization	Huawei, HiSilicon, CATR, Nokia, NSN	

Decision: The document is noted.
Proposal:

- Multi-hop synchronization is supported. When a UE is selecting its transmitter timing, ~~T~~the sources with timing reference derived originally from eNBs have higher priority than the sources with timing reference derived originally from UEs out of coverage
  - An in-coverage UE can transmit D2DSS with the timing of D2DSS derived from the eNB of the cell that the UE is camping on, in case that it detects a D2DSS from an out-of-coverage source.
    - Such a transmission is under eNB control
  - FFS: Maximum hop number (but is finite)

Questions on:

- How mobility of UEs is handled

- How and how often UEs notify their stratum level
- How many synchronisation sources /references is the UE receiver assumed to traack?

Discuss further until RAN1#76bis.

R1-140939	WF on Timing Alignment for the UE on Edge of Network Coverage	ITRI, Huawei, HiSilicon, III	

Decision: The document is noted. Discuss further until RAN1#76bis:

- When a UE receives two D2DSSs with misaligned timing from synchronization sources with different types, e.g. eNB and out-of-coverage UE, the UE ~~will notify out-of- coverage UE misalignment of the timing with the network~~will transmit D2DSS with timing based on the eNB
  - ~~FFS for notification procedure~~
  - FFS if timing alignment procedure is necessary to prevent potential interference from the UEs out of network coverage

Questions:

- How misaligned is "misaligned"?

R1-140938	WF on Triggering Condition for Transmitting D2DSS	ITRI, III	

Decision: The document is noted. Discuss further until RAN1#76bis:

- A UE will determine if the signal strength from eNodeB is below XdBm and determine if the signal strength from D2D UE transmitting D2DSS is below YdBm
  - If both conditions are met, the UE can transmit D2DSS
    - X and Y are FFS
  - Measurement of signal strength is FFS

R1-140895	WF on D2DSS selection	LG Electronics, Qualcomm, Fujitsu, ETRI, CATT, General Dynamics Broadband UK	

Decision: The document is noted.

Working assumption:

- After giving priority to synchronisation sources which are eNBs, followed by UEs within network coverage, Sselection of D2DSS for derivation of D2D transmission timing is based on at least the following metrics:
  - Received D2DSS quality: e.g. A UE selects a D2DSS with a better received signal quality when all the other metrics are the same.
  - ~~Synchronization source type: A UE selects a D2DSS originated from the eNB when all the other metrics are the same.~~
  - FFS: Stratum level: A UE selects a D2DSS with a smaller stratum level when all the other metrics are the same.
- FFS on further detailed D2D selection criterion.
- FFS whether to define the measurement for received D2DSS quality.
- FFS on how synchronization source type and stratum level can be carried by D2DSS/PD2DSCH.

Friday 14th

R1-140896	WF on D2D synchronization signal format	LG Electronics, Qualcomm	

The document was presented by Hanbuyl Seo from LGE.

- A D2DSS in a subframe consists of at least N symbols PD2DSS where N is larger than 1.
  - FFS on the resource mapping details
  - FFS whether N can be different in different scenarios (e.g., CP length, network coverage).
- Working assumption on SD2DSS is revisited.
  - SD2DSS is an M sequence or a ZC sequence if supported.

Discussion: Companies supporting the addition of one more sequence → LGE, Qualcomm, Sharp, ETRI
Objecting to change working assumption: Broadcom, Ericsson, ALU, ASB, Huawei, HiSilicon, Samsung, ITRI, Intel, ZTE.
Decision: The document is noted. Continue discussion until RAN1 #76 bis meeting

R1-140930	WF on D2D Synchronization	LG Electronics, Ericsson, CATT	

The document was presented by Hanbuyl Seo from LGE.
Decision: The document is noted. Continue discussion until RAN1 #76 bis meeting

Detailed signal and channel design

R1-140462	Signal Design for D2D Synchronization	Qualcomm Inc.	

The document was presented by Saurabh Tavildar from Qualcomm and proposes:

- Proposal 1: a D2DSS with low duty cycle is proposed to consist of at least two consecutive repeated PD2DSS transmission to enable symbol-level search, and additional PD2DSS symbols separated in time for imptoved synchronization performance
- Proposal 2: PD2DSCH should mostly reuse PUSCH signaling.
- Proposal 3: D2DSS does not need to consist of a SD2DSS.

Decision: The document is noted.

R1-140612	Synchronization Design for D2D Communication	Broadcom Corporation	

The document was presented by Daewon Lee from Broadcom and proposes:

- Proposal 1: Adopt the following principles for the synchronization design in D2D communication:
  - Limit requirements related to channel raster, not to force UE to search 100 kHz carrier raster as in the current LTE downlink for supported bands. Supported carrier frequencies could be e.g. pre-configured in public safety applications.
  - Limit the candidate frequency resources on which the synchronization signals for initial signal detection and synchronization are always transmitted. Do this even if frequency domain hopping is used for data.
  - Limit the number of possible primary and secondary synchronization signals.
  - No real justification to identify UE from synchronization signals exists similarly as eNB in physical layer – UE identification to be done in higher layers.
  - Select one cyclic prefix length motivated by the coverage targets by public safety system.
- Proposal 2: At least PD2DSS/SD2DSS are OFDM based in D2D.

Decision: The document is noted.

R1-140839	On the Design of D2DSS and PD2DSCH	LG Electronics	(R1-140329)

The document was presented by Hanbyul Seo from LGE and proposes:

- Proposal 1: The D2DSS consists of PD2DSS and SD2DSS that are symbol-level repetition of LTE PSS and SSS within a subframe.
- Proposal 2: SD2DSS is necessary to distinguish synchronization source and the root indices of PD2DSS and SD2DSS are used to deliver the information on the ID of the synchronization source.
- Proposal 3: PD2DSCH is transmitted to convey the information such as D2D communication system bandwidth, location of D2D subframes, transmission power, PD2DSCH-transmitter's synchronization type, hop counter, existence of relay-capable UE, and expiration time.
- Proposal 4: PD2DSCH could be demodulated using D2DSS that surrounds PD2DSCH in the time domain.

Decision: The document is noted.

Not treated.

R1-140050	System considerations for D2D synchronization	Huawei, HiSilicon	
R1-140096	Discussion on D2D synchronization design	CATT	
R1-140127	Discussion on D2D synchronization procedure	Intel Corporation	
R1-140172	Remaining considerations for design of D2D Synchronization and UE Identification	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140207	Design considerations for D2DSS	Huawei, HiSilicon	
R1-140216	D2D Synchronization Signals	ETRI	
R1-140225	D2D Synchronization between in and out of coverage UEs	HTC	
R1-140233	Discussion on synchronization for D2D communication	China Telecom	
R1-140269	Synchronization design for D2D Broadcast Communication	ZTE	
R1-140330	Discussion on D2D Synchronization Procedure	LG Electronics	
R1-140404	D2D Timing Selection and Timing Forward	ITRI	
R1-140405	A Consideration of OFDM vs. SC-FDMA based on PSS/SSS-structured D2DSS	ITRI	
R1-140463	Resource allocation for D2D Synchronization	Qualcomm Inc.	
R1-140464	Multi-hop D2D synchronization performance	Qualcomm Inc.	
R1-140505	Rough synchronization procedure in D2D	Panasonic	(R1-135398)

R1-140571	On D2D synchronization design	Nokia, NSN	
R1-140588	Remaining issues in D2D synchronization	Sony	
R1-140656	Synchronization design remaining aspects	InterDigital	
R1-140773	Synchronization Procedures for D2D Discovery and Communication	Ericsson	
R1-140774	Synchronization Signals and Channel Design for D2D Discovery and Communication	Ericsson	
R1-140834	Evaluation results of timing synchronization for D2D broadcast communication	Samsung	(R1-140386)
R1-140847	D2D Synchronization signal relay by UE	Samsung	(R1-140387)
R1-140853	Mechanisms and Performance of D2D Synchronization	III	(R1-140424)

7.2.8.1.2 D2D data communication physical channel design details

Control signalling

R1-140466	Control for D2D broadcast communication	Qualcomm Inc.	

Decision: The document is noted.

R1-140051	On the benefits of having closed loop feedback	Huawei, HiSilicon	

Decision: The document is noted.

Thursday 13th

R1-140053	Physical channel design for D2D communication	Huawei, HiSilicon	

Decision: The document (Section 2) is noted. Huawei's priority is RV and NDI.

R1-140102	Control for D2D communication	CATT	

Decision: The document is noted.

R1-140270	D2D physical channel design detail	ZTE	

Decision: The document is noted.

Conclusion:
A means (explicit or implicit) is needed for a receiving UE to identify which D2D data transmissions can be combined.
Study further until RAN1#76bis how to implement the means for a receiving UE to identify which D2D data transmissions can be combined.

Working assumption:
- Blind D2D data communication transport block retransmissions are supported

Study further until RAN1#76bis which of the following items of control signalling are needed for D2D data communication, including how these relate to the means for a receiving UE to identify which D2D data transmissions can be combined.
- NDI
- Tx UE ID
- Explicit RV indicator
- MCS indication
- Others are not precluded

R1-140882	WF on Scheduling of D2D Communication	Ericsson, Qualcomm, Kyocera, GDBUK	(R1-140862)

Decision: The document is noted.
Proposal:
- For direct broadcast communication:
  - Scheduling assignments are transmitted on the physical direct data channel
    - FFS if scheduling assignments are L1 or MAC elements
    - Scheduling assignments include at least indication of the resource(s) for reception of the associated physical direct data channel
      - The indication of resource(s) for reception may be implicit based on scheduling assignment resource or content
  - Scheduling assignments are followed by data transmission by the UE that transmitted the scheduling assignment

- Resource allocation for scheduling assignments:
  - For a UE in-coverage: scheduling assignments are transmitted by the UE on resources that are scheduled by the eNB
  - For a UE in edge-of-coverage: scheduling assignments are transmitted by the UE on resources that are configured by the eNB
  - For a UE out-of-coverage: scheduling assignments are transmitted by the UE on resources that:
    - are signaled by a UE that is in-coverage
    - are signaled by a UE that is in edge-of-coverage,
    - have been pre-configured for use when no resources have been signaled.

Thursday 13th

R1-140982	D2D Offline Session Outcome	Qualcomm Incorporated (Rapporteur)	

Decision: The document is noted.

Working Assumption:

- For D2D broadcast communication, scheduling assignments that at least indicate the location of the resource(s) for reception of the associated physical channel that carries D2D data are transmitted by the broadcasting UE
  - The indication of resource(s) for reception may be implicit and/or explicit based on scheduling assignment resource or content
- Scheduling assignments use PUSCH structure for transmission
  - Details of PUSCH structure including DMRS and RE mapping are FFS
  - At least the following are not precluded from further study: Scheduling assignments piggybacked with data, or indicated over DMRS
- For Mode 2
  - A resource pool for scheduling assignment is pre-configured and/or semi-statically allocated
    - FFS whether the resource pool for scheduling assignment is same as the resource pool for D2D data
  - UE on its own selects the resource for scheduling assignment from the resource pool for scheduling assignment to transmit its scheduling assignment
- For Mode 1
  - the location of the resources for transmission of the scheduling assignment by the broadcasting UE comes from the eNodeB
  - the location of the resource(s) for transmission of the D2D data by the broadcasting UE comes from the eNodeB

Discuss the following further offline:

- ***Additional Proposal for Mode 1***
  - *A resource pool for scheduling assignment is semi-statically allocated*
    - *If there is a resource pool allocated for D2D data it is FFS whether the resource pool for scheduling assignment is same as the resource pool for D2D data*

Not treated.

R1-140052	Considerations of D2D communication	Huawei, HiSilicon	
R1-140100	Physical channel design for D2D communication	CATT	
R1-140101	Channel scrambling and DMRS design for D2D communication	CATT	
R1-140128	Discussion on D2D data communication physical channel design	Intel Corporation	
R1-140173	D2D communication channel design for broadcast	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140196	Further analysis on control Information for D2D communication	Fujitsu	
R1-140217	D2D data communication physical channel design	ETRI	
R1-140331	D2D Communication Physical Channel Design	LG Electronics	
R1-140388	Physical channel design for D2D communication	Samsung	
R1-140465	Signal design for D2D broadcast communication	Qualcomm Inc.	

R1-140490	Considerations of subframe design for D2D and cellular resource multiplexing	NEC	
R1-140506	Physical channel design in D2D communication	Panasonic	(R1-135399)
R1-140511	ProSe device-to-device communication control channel design	General Dynamics Broadband UK	
R1-140657	Physical channel design for D2D communication	InterDigital	
R1-140662	On control information of D2D communication	CATR	
R1-140775	Frame Structure for D2D-Enabled LTE Carriers	Ericsson	
R1-140776	D2D Physical Channels Design	Ericsson	
R1-140777	Scrambling of D2D Physical Channels	Ericsson	
R1-140880	WF on D2D broadcast communication phy design	Qualcomm, General Dynamics Broadband UK, ZTE, CATT, LGE	

7.2.8.1.3 Resource allocation

R1-140130	Discussion on D2D broadcast resource allocation	Intel Corporation	

The document was presented by Alexey Khoryaev from Intel and proposes:

- TDM+FDM based resource allocation type within data transmission region is considered for D2D broadcast communication.
- Further study autonomous and assisted resource selection schemes as a baseline solutions for out of coverage scenario.
- Further study the discussed synchronization and resource allocation as a candidate for long range D2D broadcast communication in out of network coverage PS scenarios.

Decision: The document is noted.

R1-140335	Multiplexing of Uu and D2D communication	LG Electronics	

The document was presented by Hanbyul Seo from LGE and proposes:

- Proper solution is needed to efficiently accommodate D2D communications while minimizing its impact on existing operations.
- Priority handling of D2DSS should be carefully addressed in consideration of link failure
- It is beneficial UEs outside network coverage are synchronized to Uu UL timing.
- Resource separation between D2D Tx and D2D Rx of UE in network coverage is supported for efficient relay operation.
- Adjacent channel coexistence issue between WAN and D2D communications should be investigated.
- Further study is needed under what condition a UE can operate WAN UL transmission and D2D reception simultaneously across two component carriers.

Decision: The document is noted.

R1-140427	Public safety perspective on resource allocation for D2D group communications	U.S. Department Of Commerce	

The document was presented by Ken Loa from USDoC and proposes:

Proposal 1:

- When transmitting UEs are out of network coverage:
  1) A UE on its own select a resource from a pre-configured resource pool to transmit on
  2) Such configurations may be re-configured by the operator
     - The details of how the resource pool is re-configured is FFS
- When transmitting UEs are in network coverage:
  1) The eNodeB or rel-10 relay node will semi-statically allocate a resource pool for D2D communication
  2) A UE will operate in three modes for resource allocation
     - In coverage: eNodeB or rel-10 relay node will schedule the exact resource within the resource pool that will be used by a UE used for D2D transmission
     - Edge of coverage: a UE on its own select a resource from the resource pool to transmit on
     - Out of coverage: a UE on its own select a resource from a pre-configured resource pool to transmit on
     - The details of how a UE selects the mode to operate on is FFS.

Proposal 2: The following scenarios should be considered for resource allocation schemes on failure rate and overall delay, which should be included in the performance metrics for D2D group communication.

1) The transmitting UE moves from in-coverage to out-of-coverage (RLF event)
2) The transmitting UE performs handover between cells with different D2D configurations, which includes RLF handover, backward handover or NAS Recovery.

3) A group of public safety UEs could spread across multiple cells. Multiple eNBs are required to coordinate each other to perform scheduling for D2D group communications

Decision: The document is noted.

R1-140468	Contention Based Scheduling of D2D Broadcast with Impairments	Qualcomm Inc.	

The document was presented by Saurabha Tavildar from Qualcomm and concludes that overhead of sensing doesn't significantly impact performance of D2D broadcast communication schemes proposed in [R1-135322].

Decision: The document is noted.

R1-140613	Resource Allocation for D2D Communication	Broadcom Corporation	

The document was presented by Daewon Lee from Broadcom and proposes:

- A distributed resource allocation scheme to be selected for D2D broadcast communication in Rel12.
- Define a radio resource reservation period of which length can be variable and the allocation of the period is performed by a transmitting UE.
- All physical layer repetitions/retransmissions of the same transport block are transmitted during one resource reservation period.

Decision: The document is noted.

R1-140778	On Scheduling Procedure for D2D	Ericsson	

The document was presented by Stefano Sorrentino from Ericsson and draws the following observations:

- The use of scheduling assignments carried by the physical direct data channel is advantageous from a flexibility/performance trade-off.
- Without SAs, the energy consumption for D2D support is unacceptable (~18 times larger than the reference case).
- The possibility of using SAs reduces energy consumption effectively, to an acceptable level.

Discussion: Telecom Italia asked why sensing needed for in-coverage use case? To cover the case of UE2 in figure 2.

Decision: The document is noted.

Looking at WFs

R1-140836	WF on D2D Communication Resource Allocation	US Department of Commerce, Qualcomm, Huawei, Ericsson, HiSilicon	

The document was presented by Shailesh Patil from Qualcomm.

- From a transmitting UE perspective a UE can operate in two modes for resource allocation:
  - Mode 1: eNodeB or rel-10 relay node schedules the exact resources used by a UE to transmit direct data and direct control information
    - Mode 1 is used for in-coverage transmission
  - Mode 2: a UE on its own selects resources from resource pools to transmit direct data and direct control information
    - FFS if the resource pools for data and control are the same
    - Mode 2 is used for edge-of-coverage and out-of-coverage
- For edge-of-coverage, the resource pools are semi-statically signaled by the eNodeB
- For out-of-coverage, the resource pools are signaled by UEs in coverage or are pre-configured in the UEs
  - FFS on whether and how an in-coverage UE can signal the resource allocation to the out-of-coverage UE
- Definition of coverage areas is FFS, but could for example be based on DL received power

Discussion: ZTE: agree with Mode 2 – more concern about Mode 1 and how scheduling is performed.
Sony: complexity should be considered due to remaining time available for this SI - D2D resource pool should be static and predefined in Rel-12.
ALU: Mode 2 is agreeable as baseline; Mode 1 is FFS
Huawei: Keep Mode 1

Decision: The document is noted.

Possible agreements

- From a transmitting UE perspective a UE can operate in two modes for resource allocation:
  - Mode 1: eNodeB or rel-10 relay node schedules the exact resources used by a UE to transmit direct data and direct control information
    - Mode 1 is used for in-coverage transmission
    - FFS if resource pool restricting the available resources for data and/or control is needed

  - Mode 2: a UE on its own selects resources from resource pools to transmit direct data and direct control information
    - FFS if the resource pools for data and control are the same
    - FFS if resource pool restricting the available resources for data and/or control is needed
- FFS the definition of in-coverage, out-of-coverage and edge of coverage

Debate on the following alternatives:
Alt 1: "Mode 1 is supported for in-coverage transmission"
- Supported by ALU, ASB, Nokia, ZTE, ITRI, Intel, HTC, EADS, Broadcom, Samsung, ETRI, CATT, Sony, NSN, Fujitsu, AT&T (ensure that operators stay in control of choosing between modes)

Alt 2: "Mode 1 is used for in-coverage transmission"
- Supported by Ericsson, Huawei, HiSilicon, Orange, Qualcomm, Telecom Italia, GDBUK, InterDigital, LGE, DT, USDoC, CeWIT, Kyocera, Sharp, CMCC, Panasonic

Alt 3: "D2D communication capable UE shall support Mode 1"

Agreements
- From a transmitting UE perspective a UE can operate in two modes for resource allocation:
  - Mode 1: eNodeB or rel-10 relay node schedules the exact resources used by a UE to transmit direct data and direct control information
    - FFS: if semi-static resource pool restricting the available resources for data and/or control is needed
  - Mode 2: a UE on its own selects resources from resource pools to transmit direct data and direct control information
    - FFS if the resource pools for data and control are the same
    - FFS: if semi-static and/or pre-configured resource pool restricting the available resources for data and/or control is needed
  - D2D communication capable UE shall support at least Mode 1 for in-coverage
  - D2D communication capable UE shall support Mode 2 for at least edge-of-coverage and/or out-of-coverage
  - FFS: Definition of out-of-coverage, edge-of-coverage, in-coverage

Agreement:
- For example, definition of coverage areas is at least based on DL received power

Possible agreements:
- D2D communication capable UE shall support both Mode 1 and Mode 2
  - FFS: Mode 2 for in-coverage and Mode 1 for edge-of-coverage, out-of-coverage
- For in-coverage, it is up to operator to allow Mode 1 and/or Mode 2
  - FFS: Mode 2 for in-coverage and Mode 1 for edge-of-coverage, out-of-coverage
- FFS how to configure between Mode 1 and Mode 2, e.g., whether there is a condition to configure switching between Mode 1 and Mode 2

Not treated.

R1-140103	Resource coordination in partial network coverage scenario	CATT	
R1-140129	Analysis of different RSRP thresholds for design and evaluation of D2D communication	Intel Corporation	
R1-140174	Resource allocation for D2D communication	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140197	RRM for D2D communication	Fujitsu	
R1-140198	Multiplexing between cellular signal and D2D signal	Fujitsu	
R1-140218	Resource allocation for D2D communications	ETRI	
R1-140271	Study on D2D Resource Allocation for Out of Network Coverage Scenario	ZTE	
R1-140334	D2D communication based on centralized scheduling	LG Electronics	
R1-140390	Resource allocation for D2D broadcast communication	Samsung	
R1-140406	Frequency Reuse for D2D Broadcast Communication	ITRI	

R1-140407	Comparison between Scheduled and Distributed Resource Allocation Mechanisms for D2D Broadcast Communications in Out-of-LTE-Coverage Cases	ITRI	
R1-140425	Resource pool configuration for partial coverage scenarios	III	
R1-140467	Cluster Head versus Distributed Resource Allocation	Qualcomm Inc.	
R1-140469	Resource Allocation for in Network D2D broadcast	Qualcomm Inc.	
R1-140491	Discussion on Multiplexing D2D link and Cellular link	NEC	
R1-140507	System-level performance analysis on resource allocation	Panasonic	
R1-140516	Radio resource sharing between Public Safety groups using D2D	EADS	
R1-140572	D2D communication performance	Nokia, NSN	
R1-140573	D2D communication: Resource allocation, multiplexing and resource access	Nokia, NSN	
R1-140589	D2D Communication Resource Scheduling	Sony	
R1-140664	D2D communication resource allocation using Scheduling Assignments	Kyocera	
R1-140779	On Synchronization Heads	Ericsson	
R1-140781	Network control and flexible resource sharing between cellular and D2D communication within network coverage	Orange	
R1-140825	On the Resource Pool Configuration for D2D Communications	LG Electronics	(R1-140332)
R1-140826	Evaluations on the Resource Selection for D2D Communications	LG Electronics	(R1-140333)
R1-140832	Evaluation results of resource allocation schemes for D2D communication	Samsung	(R1-140389)
R1-140859	WF on resource pool configuration for D2D communication	LG Electronics, Ericsson, Qualcomm, ITRI	
R1-140897	WF on cellular HARQ-ACK and D2D collision avoidance	NEC, LGE	
R1-140931	WF on Multiplexing of D2D and WAN from system perspective	Samsung, NTT DoCoMo, Ericsson, ZTE, Orange, AT&T, InterDigital, Nokia, NSN	

7.2.8.1.4 Other

Not treated.

R1-140391	Discussion on D2D and cellular communication multiplexing	Samsung	
R1-140780	On Procedures for In/Out of NW Coverage Detection for D2D	Ericsson	

7.2.8.2 D2D discovery

R1-140426	Out of network coverage discovery for public safety in Release 12	U.S. Department Of Commerce	

7.2.8.2.1 Discovery signal and message design details

R1-140574	Discovery signal design	Nokia, NSN	

The document was presented by Cassio Ribeiro from Nokia and proposes:

- Proposal 1:
  - RAN1 to clarify the needs for interference randomization, taking into account D2D discovery resource allocation and time-frequency hopping of D2D discovery signals.
  - In case UE specific scrambling is to be considered as auxiliary interfere randomization method, the number of possible scrambling seeds has to be minimized in order to avoid prohibitive complexity for the receiver UE. Moreover, in this case:
    - FFS on how the scrambling seed is known to discovering UE. Identification through the discovery sequence can be taken as baseline.
    - FFS on how UEs select the scrambling seed for discovery message transmission
- Proposal 2: The current UL DMRS density is seen as sufficient for D2D discovery operation.
- Proposal 3: In case discovery range in the order of 500m or larger is required, consider applying the extended LTE CP length for D2D discovery operation. Otherwise, the normal LTE CP length should be utilized.
- Proposal 4: QPSK is used for discovery message. Re-use the PUSCH channel coding chain (including CRC)
- Proposal 5: Slot-wise frequency hopping should be considered on designing the discovery message transmission.

- Proposal 6: RAN1 should study the need of physical layer related information carried in the message part of the discovery signal.
- Proposal 7: Discovery sequence and UL DMRS should be decoupled, i.e. UL DMRS should not be used as discovery sequence.

Decision: The document is noted.

R1-140055	D2D discovery message design	Huawei, HiSilicon	

The document was presented by Hossein Bagheri from Huawei and proposes:

- **Error! Reference source not found.**~~Proposal 1:~~ **Error! Reference source not found.**~~For discovery message size of less than about 200 bits, convolutional code is slightly preferred.~~
- **Error! Reference source not found.**~~Proposal 2:~~ **Error! Reference source not found.**~~The CRC length should be selected according to the message size, and a design target maximum number of UEs participating in the discovery process.~~
- **Error! Reference source not found.**~~Proposal 3:~~ **Error! Reference source not found.**~~Scrambling sequence is derived based on the sequence part and the location of the discovery signal.~~
- **Error! Reference source not found.**~~Proposal 4:~~ **Error! Reference source not found.**~~Use QPSK for discovery message.~~
- **Error! Reference source not found.**~~Proposal 5:~~ **Error! Reference source not found.**~~Study the impact of using the discovery sequence part in demodulation.~~
- **Error! Reference source not found.**~~Proposal 6:~~ **Error! Reference source not found.**~~Discovery message and sequence parts are multiplexed in time.~~
- **Error! Reference source not found.**~~Proposal 7:~~ **Error! Reference source not found.**~~The distribution of the sequence part in time and frequency is FFS.~~

Decision: The document is noted.

R1-140661	Consideration on D2D discovery signal and message	CATR	

The document was presented by Ms Ying Du from CATR and shows preference to sequence other than demodulation sequence as one option of discovery design, and to the two step D2D discovery procedure. It is also proposed that 1 PRB pair for discovery message could be the baseline for evaluation.

Decision: The document is noted.

R1-140131	On D2D discovery physical structure design	Intel Corporation	

The document was presented by Debdeep Chatterjee from Intel and proposes:

Proposal 1

- Discovery signal is composed of a message and a sequence part where the sequence is the DM-RS of the message part.

Proposal 2

- For FDD systems, IFDMA signal structure with an RPF of 2 can be considered for guard period generation to address the Tx-Rx and Rx-Tx switching time issue.
- For FDD systems, in order to avoid intra-discovery and inter-WAN and discovery interference, guard period may be considered in the last OFDM symbol of the discovery resource. Either data or reference symbol can be allocated in this OFDM symbol.
- Handling of Tx-Rx/Rx-Tx switching time and inter-WAN-DZ interference at the boundaries of D2D DZ may be addressed in multiple ways, including relying on implementation-based solutions. RAN1 WG should carefully study each alternative towards determining the most appropriate step in this direction.

Proposal 3

- A common scrambling identity should be considered for message-based D2D discovery.
- The study of the need of time-varying hashing/scrambling function prior to channel coding for security purposes for restricted discovery may be out of scope of RAN1.

Proposal 4

- For a message size of 104 bits, TBCC in Rel-8 should be considered for message-based D2D discovery in order to limit the decoding complexity and reduce the UE power consumption.
- For a message size of 104 bits, 16 bit CRC should be considered for message-based D2D discovery.

Decision: The document is noted.

R1-140175	D2D discovery channel design	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

The document was presented by Fang Chen Cheng from ALU and proposes:

- Proposal 1: For simplicity of D2D system design, the same channel coding scheme is applied for all the supported discovery message sizes and D2D communications. The Rel-8 Turbo coding is preferred to other coding schemes.
- Proposal 2: An open-loop power control scheme should be adopted for D2D discovery in network coverage.
- Proposal 3: The D2D discovery message is carried on the D2D data communication physical channel.

Discussion: Huawei → concern with what power control is going to be used? Proposal seems open-loop power control only.
Decision: The document is noted.

R1-140272	Design Details of Discovery Signal	ZTE	

The document was presented by Yifei Yuan from ZTE and proposes:

- Proposal 1: Rel-8 PUSCH DMRS should be reused for discovery signal; The number of cyclic shifts for discovery sequence should be smaller than 12, FFS whether fixed in the specification or by signalling.
- Proposal 2: non-UE-specific scrambling should be considered at least for discovery type 1; for asynchronous deployments, scrambling sequence should be cell-specific. For synchronous deployments, non-cell-specific scrambling should be the baseline.
- Proposal 3: each discovery signal occupies one PRB pair of resources.
- Proposal 4: 16 bits CRC is considered as the baseline for discovery message.
- Proposal 5: TBCC should be considered for channel code of discovery message.
- Proposal 6: for discovery purpose, CP length may be configurable by the network.

Decision: The document is noted.

R1-140665	Channel coding for D2D discovery signal	Kyocera	

The document was presented by Amit Kalhan from Kyocera and states that the link-level performance between turbo coding and TBCC is insignificant given the message size is 104 bits long. Considering higher decoding complexity of turbo codes relative to TBCC and requiring large number of candidate discovery signal decoding in a given time period it is preferred to use TBCC as it has lesser computational load. From both the link-level performance and the false alarm probability perspective, TBCC with 24 bits CRC is preferable for D2D discovery signal.

- Proposal: Based on the above observations we propose TBCC with 24 bits CRC for D2D discovery signal.

Decision: The document is noted.

R1-140470	D2D discovery signal and message design	Qualcomm Inc.	

The document was presented by Shailesh Patil from Qualcomm and proposes:

- Proposal 1: Discovery sub-frame should be similar to an uplink WAN sub-frame used for PUSCH transmission. However the last symbol(s) of the sub-frame could be used as a gap.
- Proposal 2: Use normal cyclic prefix for discovery transmissions. For large discovery range extended cyclic can be used.
- Proposal 3: DMRS signals transmitted as part of discovery signal should not depend on cell identity.
- Proposal 4: QPSK modulation should be used for discovery.
- Proposal 5: Turbo coding should be used for discovery.
- Proposal 6: Same channel interleaver as PUSCH should be used for discovery.
- Proposal 7: No inter-slot hopping should occur for discovery transmissions. The resource element mapping should be identical to PUSCH resource mapping with no inter-slot hopping.
- Proposal 8: Discovery scrambling mechanism should be identical to the PUSCH scrambling mechanism with the exception that the scrambling sequence should not be dependent on UE or cell identity.
- Proposal 9: A CRC length of 24 should be used for discovery message transmission.

Discussion: LGE → concern with no inter-slot hopping (proposal 7).
Telecom Italia: what means "For large discovery range" (proposal 2)? Order of magnitude?
Decision: The document is noted.

R1-140512	ProSe device-to-device discovery sequence design	General Dynamics Broadband UK	

The document was presented by Mark Cannon from GDBUK and proposes:

- Proposal 1: The discovery sequence is based upon PSS
- Proposal 2: The discovery sequences are SFN combined, at least from devices within the same cell
- Proposal 3: The discovery sequence is transmitted at the start of the discovery region.
- Proposal 4: The discovery root sequence indicates the duration of the number of discovery subframes from a finite set of options.

- Proposal 5: The discovery sequence root index does not coincide with those used for conventional cell synchronisation signals and / or the transmission of the discovery sequence does not coincide with the 100kHz LTE frequency raster.

Decision: The document is noted.

R1-140885	WF on D2D Signal Design	Qualcomm, General Dynamics Broadband UK, CATT, LG, CEWiT	

The document was presented by Shailesh Patil from Qualcomm.

- When a UE switches from uplink transmission to a D2D reception on a sub-frame boundary the D2D reception can be punctured
- The last symbol(s) of a D2D transmission in a sub-frame can consist of a gap
  - The size of the gap is FFS
    - The size can depend on cell size
  - FFS whether gap size needs to be an integer multiple of a symbol size

Decision: The document is noted.

Working Assumption for both communication and discovery:

From the perspective of a single UE:

- No DTX period is introduced solely to aid switching for the case when a UE switches from uplink transmission to D2D reception
- In the event of a time domain conflict between UL WAN transmission and D2D transmission and/or reception and/or switching, UL WAN transmission is always prioritized
- The last symbol(s) of a D2D transmission can consist of a gap
  - The size of the gap is FFS between ½, 1 and 2 symbols – revisit at RAN1#76bis
  - FFS whether the size can depend on cell size – revisit at RAN1#76bis
  - FFS whether the gap is created by puncturing or rate matching
  - FFS whether, and if so how, the receiver is made aware of the presence (and length if variable) of the gap
  - FFS in which circumstances the gap exists
- No DTX period is introduced solely to aid switching for the case when a UE switches from D2D transmission to D2D reception, nor from D2D reception to D2D transmission.

Is the discovery sequence the demodulation RS of the discovery message?

- Yes: Qualcomm, Intel, Samsung, ZTE, CATT, Huawei, HiSilicon, Ericsson
- No: Broadcom, Fujitsu, Nokia, NSN, GDBUK, ALU, ASB

Working Assumption (tentative):

- Transmission of a discovery message by a UE can be preceded by transmission of a D2DSS
  - Note that D2DSS is not the message DMRS
- "Discovery sequence" concept introduced in working assumption in RAN1#74bis no longer exists.
- None of the discovery message payload is carried by the message DMRS
- FFS whether there are any cases when the discovery message may be not preceded by transmission of a D2DSS

Check in Wednesday's session whether further clarifications or progress can be made.

Wednesday 12th:

Working Assumption:

- A UE that transmits a discovery message may also be a synchronisation source (and therefore also transmit D2DSS)
  - Note that D2DSS is not the message DMRS
- "Discovery sequence" concept introduced in working assumption in RAN1#74bis no longer exists. (but see open discussion below on discovery preamble)
- None of the discovery message payload is carried by the message DMRS
- A UE transmitting a discovery message does not necessarily need to be a synchronisation source

Further discussion on Discovery Preamble:

Question: Can a UE that transmits a discovery message (including DMRS) also transmit a "discovery preamble" prior to the discovery message, where the "discovery preamble" is different from a D2DSS in one or more of the following ways:

- E.g. if D2DSS is periodic and "discovery preamble" is not?
- Different sequence?

- Different bandwidth?

Possible purposes for "discovery preamble":
- Fine tuning of time and/or frequency synchronisation
- Channel estimation assistance for discovery message decoding
- AGC setting

Is a discovery preamble needed?
Yes: Broadcom, Fujitsu, Nokia, NSN, LGE, Sony, ITRI, CATR, NEC (for ooc), ALU, ASB
No: QC, Intel, GDB, NEC (in-coverage), E///, CATT, Samsung, HW, HiSilicon, ZTE
Conclusion: FFS until RAN1#76bis.

Working assumption:
- At least if message is not smaller than 104 bits, Rel-8 turbo coding is used for the discovery message

Not treated.

R1-140097	Details of discovery signal design	CATT	
R1-140199	On D2D discovery signal design details	Fujitsu	
R1-140392	Physical channel design for D2D discovery	Samsung	
R1-140408	AGC Impact to Discovery Signal Frame Structure	ITRI	
R1-140513	ProSe device-to-device discovery link performance	General Dynamics Broadband UK	
R1-140590	Discovery signal and message design in resource allocation aspect	Sony	
R1-140629	Views on D2D discovery signal design	NTT DOCOMO	
R1-140840	D2D Discovery Signal Format	LG Electronics	(R1-140336)

7.2.8.2.2 Resource allocation

R1-140057	Resource allocation for type-1 discovery	Huawei, HiSilicon	

The document was presented by Philippe Sartori from Huawei and proposes:
- Proposal 1: D2D UE and/or central node should monitor and report the usage of allocated discovery resource pool to assist the determination of size of discovery resource pool.
- Proposal 2: Combining across several transmissions should be used to improve discovery performance.

Decision: The document is noted.

R1-140098	Further discussion on resource allocation for D2D discovery	CATT	

The document was presented by Ms Ying Peng from CATT and proposes:
- Proposal 1: UE Grouping based discovery period/offset and resource configuration can be adopted for cases of insufficient discovery resources.
- Proposal 2: Allocation of multiple discovery resources within one discovery period for a certain message can be considered especially for case of sufficient discovery resources.
- Proposal 3: In case of multiple discovery resources for one message, information combination of the discovery resources in receiver can be achieved via fixed mapping pattern, e.g. RMP 4.
- Proposal 4: Random resource selection can be the baseline scheme for further study of type 1 discovery.
- Proposal 5: During the study of resource hopping, the possibility to apply the same hopping pattern for type 1 discovery, type 2 discovery and communication should be taken into count.

Decision: The document is noted.

R1-140176	D2D discovery channel resource allocation	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

The document was presented by Fang Chen Cheng from ALU and proposes:
- Proposal 1: For type 1 discovery procedure, the channel allocation/selection for each UE is performed in a distributed manner. Random channel selection is preferred to sensing-based channel selection.
- Proposal 2: A hierarchical period structure is adopted for the discovery resource selection.

Decision: The document is noted.

R1-140472	Resource allocation for D2D discovery	Qualcomm Inc.	

The document was presented by Shailesh Patil from Qualcomm and proposes that random selection is used a baseline for resource selection. Energy based selection should also be considered.
Decision: The document is noted.

R1-140514	ProSe device-to-device discovery resource allocation	General Dynamics Broadband UK	

The document was presented by Mark Cannon from GDBUK and proposes that the resources allocated to the discovery message should not be segmented and the modulation used should be QPSK.
Decision: The document is noted.

R1-140575	Resource allocation for discovery signals	Nokia, NSN	

The document was presented by Cassio Ribeiro from Nokia and proposes:
- Proposal 1: Start by specifying Type 1 resource allocation with slotted Aloha. Leave potential enhancements by the introduction of carrier sensing based Type 1 allocation and Type 2 allocation for future standard releases.
- Proposal 2: For all type of resource allocations, a semi-static resource pool will be indicated in a SIB. Also Type 2 resources are allocated from the semi-static resource pool (if Type 2 allocation is to be supported).
- Proposal 3: If Type 2 or carrier sensing based Type 1 resource allocation needs to be specified, as a common solution consider specifying resource sequences with time and frequency hopping. Time hopping is designed so that UEs allocated on different resource sequences have frequent opportunities to detect each other despite of the half-duplex assumption.
- Proposal 4: Consider PDCCH signalling for rapid permission control of semi-statically allocated discovery resources.
- Proposal 5: Study the need and implementation of a distributed load control system for slotted Aloha Type 1 access.
- Proposal 6: Study the issue on the conflict between cellular PUCCH and discovery transmission for Type-1 resource allocation
- Proposal 7:
  - Do not assume listening of neighbour cell's system information as a pre-requisite for inter-cell discovery.
  - Discuss on networks ability to provide accurate information on the discovery resource timings in other cells and, if discovery without proper timing information is needed, study further whether it can be based on the sequence parts of the signals without any additional timing synchronization signal transmitted by UEs.

Decision: The document is noted.

R1-140135	On support of inter-cell D2D discovery	Intel Corporation	

The document was presented by Debdeep Chatterjee from Intel and is summarized as:
- Proposal 1: For synchronous LTE deployments, the D2D Discovery Zones should be configured in a network-common manner.
- Proposal 2: For asynchronous LTE deployments, the D2D Discovery Zones should be configured so as to minimize the probability of any overlap of the D2D DZs of neighbouring cells to avoid asynchronous interference.
- Proposal 3: Effective handling of inter-cell interference between D2D discovery and UL WAN transmissions should be carefully studied by RAN1 WG for the support of D2D discovery in asynchronous networks.
- Proposal 4: For synchronous LTE deployments, ProSe-enabled UEs use DL timing of the serving cell as their synchronization reference for transmission and reception, i.e. T1 = DL serving cell reference time.
- Proposal 5a: For inter-cell discovery in asynchronous LTE deployments, ProSe-enabled UEs derive the timing of the neighbouring cell for reception of discovery signals either:
  - by directly acquiring the PSS/SSS transmissions from the neighbouring cell;
  - by using PRS subframes of neighbouring cells when available;
  - by receiving UE-relayed synchronization signals carried as part of discovery announcement signals by certain UEs in the neighbouring cell.
  - The decision of whether to support all three mechanisms or perform a down-selection from the above is FFS.
- Proposal 5b: For asynchronous LTE deployments, the configuration of D2D Discovery Zones of neighbouring cells can either be:
  - signalled by the serving cell;
  - directly acquired by the ProSe-enabled UEs using assistance information from the serving cell about the relevant SIB transmitted by the neighbouring cell;
  - carried as part of discovery announcement signal transmitted by certain UEs in the neighbouring cell.
  - The decision of whether to support all three mechanisms or perform a down-selection from the above is FFS.
- Proposal 6: For asynchronous LTE deployments, while UEs can derive synchronization based on timing of neighbouring cells for reception of inter-cell discovery signals, they may only transmit discovery signals within the D2D DZs configured by the respective serving cell using the serving cell DL reference time, i.e., T1 = DL serving cell reference time.

Decision: The document is noted.

R1-140493	On resource allocation for inter-cell discovery	NEC	

The document was presented by Rajitha Palipana from NEC and proposes to consider time domain grouping of nearby D2D UEs that are not far from each other to a subinterval within the discovery region of serving cell. The size of most appropriate subinterval is FFS.
Decision: The document is noted.

Looking at WFs

R1-140860	WF on Type 1 Discovery Resource Allocation	Qualcomm Inc., General Dynamics Broadband UK, ZTE, Samsung, Intel, Huawei, HiSilicon, CATT	

The document was presented by Shailesh Patil from Qualcomm.
- Type 1: a discovery procedure where resources for discovery signal transmission are allocated on a non UE specific basis
- Baseline: Each discovery period, a UE pseudo-randomly selects a discovery resource to transmit on
  - When in-coverage, discovery period is configured by eNodeB
  - Other schemes can be considered later

Decision: The document is noted.

Agreements:
- Baseline: For each discovery period, a UE can transmit on a randomly selected discovery resource
  - When in-coverage, discovery period and amount of discovery resource(s) are configured by eNodeB
  - Other schemes can be considered later

Tuesday afternoon session

R1-140863	WF on resource allocation for type 1 D2D discovery	CATT, Huawei, HiSilicon, Intel, ITRI, LGE	

The document was presented by Ms Ying Peng from CATT.
- A UE transmits on its discovery message transmission resource from one/combination of following options
  - Option 1: based on Tx UE transmission period and offset (i.e. UE grouping)
  - Option 2: based on a fixed or adaptive transmission probability derived from a preconfigured/configured nominal transmission probability
- Resource for a single transmission of unique discovery information by a UE within a discovery period should consist of contiguous resource in time domain
  - The single transmission or the first single transmission if there is repetition in each discovery period for Tx D2D UE is based on random resource selection
- Repetition of transmission of unique discovery information by a UE within a discovery period is allowed
  - The maximum number of repeated transmissions is FFS
  - FFS: whether resources for repeated transmission(s) follow a deterministic mapping or random

Discussion: ALU → concern with UE grouping – other options are FFS.
Decision: The document is noted, modified and agreed as:

Working Assumption:
- Further to the baseline agreed above, the following FFS options can be further studied (including number of discovered devices and latency) for a UE's transmission on a discovery resource (or on a set of resources if repetition is supported):
  - Option 1: based on Tx UE transmission period and offset
  - Option 2: based on a fixed or adaptive transmission probability derived from a preconfigured/configured nominal transmission probability
  - Others
- A discovery resource has a duration of not less than 1ms (FFS if it can be >1ms if required by the final decision on MAC PDU size, in which case it would be a multiple of 1ms and consist of consecutive D2D subframes) and is used for a single transmission of a given discovery MAC PDU by a UE
  - TDD special subframe is FFS
- Repetition (either contiguous or non-contiguous) of transmission of a given discovery MAC PDU by a UE within a discovery period is FFS; if supported:
  - FFS between:

- The UE performs random selection only for the first resource in the set of discovery resources that can be used for the repeated transmissions of the discovery MAC PDU; the other resources are deterministically associated with the first resource.
- The UE performs random selection for each resource in the set of resources.

– The maximum number of repeated transmissions is FFS

R1-140841	D2D discovery resource size and mapping to physical resources	Intel Corporation	(R1-140132)

The document (section 3) was presented by Debdeep Chatterjee from Intel and draws the observation that 1×N resource mapping scheme can achieve better link-level discovery performance than N×1 resource mapping scheme in the case with and without co-channel interference.
Discussion: Mr Chair commented that results show the interest in supporting repetition.
Decision: The document is noted.

R1-140889	Resource allocation for Type1 discovery for inter-cell discovery	Qualcomm, General Dynamics Broadband UK, Fujitsu, ZTE, Samsung, DoCoMo, Kyocera	

The document was presented by Shailesh Patil from Qualcomm.

- For synchronous deployment the discovery resource allocation can be common across deployment
- For synchronous deployment with different resource allocations for different eNodeBs
  - eNodeBs learn the allocation of neighbor eNodeBs
  - eNodeBs broadcast the information to associated UEs using SIB signaling
- For asynchronous deployment
  - eNodeBs learn the allocation of neighbor eNodeBs
  - eNodeBs broadcast the information to associated UEs using SIB signaling
  - Note that eNodeBs may need to keep track of relative time drift of neighbor eNodeBs to learn and broadcast the allocation

Discussion: Ericsson commented that such WF relates to RAN3 – joint proposal is under preparation in RAN3.
Decision: The document is noted. It is agreed awaiting RAN3 discussion results – up to RAN3 to send an LS if they need any information from RAN1.

R1-140861	WF on Types of Discovery	Qualcomm Inc., General Dynamics Broadband UK, CATT, LG, Intel	

The document was presented by Shailesh Patil from Qualcomm.

- Type 1 and Type 2B discovery are supported
- For Type 2B discovery
  - eNodeB semi-persistently allocates a discovery resource for a UE to transmit on
  - Only RRC_CONECTED UEs transmit
  - Value of T2 is FFS
  - Other current agreements and working assumption on Type1 discovery will also apply to Type 2B

Decision: The document is noted.

Proposal:

- Type 1 and Type 2B discovery are supported
- For Type 2B discovery
  - eNodeB semi-persistently allocates a discovery resource for a UE to transmit on
  - Only RRC_CONECTED UEs transmit
  - Value of T2 is FFS
  - Type1 and Type 2B use the same sequence+message design

Revisit after AI 7.2.8.3
Wednesday 12th:
Continue to study both type 1 and type 2 discovery as per the definitions agreed in RAN1#73.

Agreement:

- For Type 2 discovery:
  - UEs transmit their discovery signal and receive discovery signals from other UEs subject to half duplex constraint

Working Assumption:

- For Type 2B discovery
  - If RRC_Idle UEs are not able to transmit type 2B discovery, value of T2 for type 2B discovery transmission is FFS between:
    - TA for FDD / 624Ts +TA for TDD:
      - HW, HiSi, Telecom Italia, ZTE, Orange, E///, Fujitsu, DT,
    - T2 = 0 for FDD, T2 = 624Ts for TDD:
      - ALU, ASB, E///, LGE, ITRI, GDB, IDC, Samsung,
  - If RRC_Idle UEs are able to transmit type 2B discovery, value of T2 for type 2B discovery transmission is:
    - T2 = 0 for FDD, T2 = 624Ts for TDD

Working Assumption:

- Type1 and Type 2B use the same message design

Friday 14th

R1-141038	WF on D2D Discovery Types Supported	Qualcomm Incorporated, General Dynamics, CATT, LG, Intel, Deutsche Telekom, Samsung, ZTE, DoCoMo, Kyocera	

The document was presented by Shailesh Patil from Qualcomm and states:

- Type 1 and Type 2B discovery are supported

Discussion: Ericsson – why such topic is brought up to plenary session again – extensive discussions during the week concluded FFS – no new information available / far away from completion
ALU – can this be taken as a working assumption?
Yes: Qualcomm, GDBUK, CATT, LGE, Intel, Deutsche Telecom, Samsung, ZTE, NTT DoCoMo, Kyocera, ALU (assuming adding type 2A is not precluded), ASB, Sharp
No: Ericsson, Huawei, HiSilicon
Decision: The document is noted.

Working assumptions:

- If D2D discovery is supported, both Type 1 and Type 2 discovery can be supported subject to investigation and positive resolving of open issues
- Note: Following open issues has not been considered in RAN1
  - Contents of discovery message
  - Impact on cellular traffic
  - Impact on other operator spectrum
  - Lawful interception impact on RAN if any
  - Potential impact on inter-eNB interfaces
- Above note should be captured in TR conclusion

Not treated.

R1-140056	Power efficiency and delay analysis of discovery	Huawei, HiSilicon	
R1-140133	On resource allocation for D2D discovery	Intel Corporation	
R1-140134	D2D discovery resource selection for Type 1 discovery	Intel Corporation	
R1-140200	Resource Allocation for Discovery Signal	Fujitsu	
R1-140203	Near-Far Mitigation for D2D Discovery	Huawei, HiSilicon	
R1-140227	Resource Allocation Methods for D2D Discovery	HTC	
R1-140273	Resource Allocation for D2D Discovery	ZTE	
R1-140292	On the use of type 2B discovery	ASUSTeK	
R1-140293	Type 2B discovery with resource hopping	ASUSTeK	
R1-140337	Resource Allocation and UE Behaviour for D2D Discovery	LG Electronics	
R1-140338	Multiplexing of Uu and D2D discovery signal	LG Electronics	
R1-140393	Resource allocation method for D2D discovery	Samsung	
R1-140394	Multiplexing between WAN and D2D from system perspective	Samsung	

R1-140492	Power consumption of RRC_IDLE UEs for discovery	NEC	
R1-140494	D2D discovery resource allocation under network coverage	NEC	
R1-140581	Views on discovery resource allocation	KDDI	
R1-140630	Views on D2D discovery resource allocation	NTT DOCOMO	
R1-140666	Resource allocation for Type 1 D2D discovery	Kyocera	
R1-140852	Resource allocation for D2D discovery	ETRI	(R1-140219)

7.2.8.2.3 Other

R1-140471	Comparison of LTE Discovery with other discovery technologies	Qualcomm Inc.	

7.2.8.3 D2D transmission timing

R1-140211	Impact of D2D transmission on the existing cellular system	Huawei, HiSilicon	

Decision: The document is noted.

R1-140339	D2D Discovery Signal Transmission Timing	LG Electronics	

Decision: The document is noted.

R1-140136	Discussion on D2D transmission timing	Intel Corporation	

Decision: The document is noted.

Working Assumption

- **For type 1 discovery,**
  - In FDD
    - RRC_Connected D2D UEs transmit discovery signal based on DL reference timing (T2 = 0).
      - FFS possible solutions to address overlap between uplink cellular and D2D
  - In TDD
    - RRC_connected and RRC_idle D2D UEs transmit discovery signal based on T2 = 624Ts
      - FFS possible solutions to address overlap between uplink cellular and D2D

R1-140888	WF on the value of T2	CATT, ALU, ASB, Intel, ITRI, Qualcomm, Samsung, ZTE	

Decision: The document is noted.
Proposal: RRC_connected and RRC_idle D2D UEs transmit discovery signal based on T2 = 624Ts

R1-140891	WF on D2D CP length	Huawei, HiSilicon, CATT, Intel, Fujitsu, LG Electronics, General Dynamics, Panasonic, Qualcomm, Ericsson, Potevio, ITRI, InterDigital, RIM	

Decision: The document is noted.

Working Assumption:

- Both extended CP length (512Ts) and normal CP length (144 Ts) are supported in the specifications for D2D communication and discovery
  - FFS: details of how to set the CP length

Not treated.

R1-140058	On cyclic prefix length for D2D discovery/communication	Huawei, HiSilicon	
R1-140099	The value of T2 for D2D transmission timing	CATT	
R1-140177	D2D transmission Timing	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140201	Further analysis of D2D transmission timing	Fujitsu	
R1-140228	Considerations on D2D Transmission Timing	HTC	
R1-140274	D2D Discovery Transmission Timing	ZTE	
R1-140340	D2D Communication Signal Transmission Timing	LG Electronics	
R1-140396	Inter-subframe impact caused by D2D timing in large cell	Samsung	
R1-140458	D2D transmission timing	Qualcomm Inc.	

R1-140515	ProSe device-to-device transmission timing	General Dynamics Broadband UK	
R1-140833	D2D transmit timing impact on WAN	Samsung	(R1-140395)

7.2.8.4 Other

R1-140473	Text Proposal for TR 36.843	Qualcomm Inc.	

Decision: The document is noted and TP is agreed for inclusion in next update of TR.

R1-140474	DraftTR 36.843 v1.0.1 on Study on LTE Device to Device Proximity Services	Qualcomm Inc.	

(only editorial changes done by MCC)
Decision: The document is noted and TR is agreed and endorsed as v1.1.0 in R1-140933. Friday 14th → it is noticed that R1-140933 has been submitted as v1.0.1 in contradiction with the decision made during the D2D ad-hoc session. For the sake of simplicity, the document is endorsed as v1.0.1 in R1-140933.

R1-140944	TR 36.843 v1.2.0 on Study on LTE Device to Device Proximity Services	Qualcomm Inc.	

Decision: The document is for email approval until 20th February

Friday 14th

R1-141037	TP for Conclusion of D2D SI	Qualcomm Incorporated, General Dynamics, USDoC, UK Home Office, Fujistu, CATT, ZTE, ITRI, Deutsche Telekom, LG, Samsung	

The document was presented by Shailesh Patil from Qualcomm.
"It is concluded that adding D2D discovery and D2D broadcast communication for public safety applications to LTE standard is feasible. D2D discovery is found to be feasible in terms of range, scalability and power consumption. D2D communication is able to fulfil the voice and data needs of the public safety community both within and outside coverage."
Discussion: Also supported by Nokia, NSN, Sharp
Ericsson asked time to review it carefully – same to Huawei.
Ericsson: What "feasible" means w.r.t range, scalability, power consumption…? → May be better to list some results
Decision: The document is noted.

Agreements:

- With the current status of work, adding D2D discovery techniques is considered compatible to LTE standard
- With the current status of work, adding D2D broadcast communication techniques is considered compatible to LTE standard, and can fulfill the voice and data needs of the public safety community both within and outside coverage.

R1-141043	Text Proposal for TR 36.843 with for D2D Evaluation Results	Qualcomm Incorporated (Rapporteur)	(R1-141034)

Decision: The document is for email approval until 19th February

Not treated.

R1-140401	Discussion on the multiplexing of D2D and Cellular signals	ITRI	
R1-140658	Freshness Parameter for Security	InterDigital	

7.2.9 Study on Network-Assisted Interference Cancellation and Suppression for LTE

SID in RP-130404.
Open issues in RP-132108

7.2.9.1 System level evaluation results

R1-140829	Evaluation results for NAIC	Qualcomm Inc.	(R1-140475)

The document was presented by Hao Xu from Qualcomm and presents system evaluation results for SLIC receivers.

- Advanced receiver techniques such as SLIC can provide significant system throughput gain over baseline receivers.

- The gains obtained based on blind SLIC receiver are very close to the gains obtained by genie-aided SLIC receiver.

Decision: The document is noted.

R1-140508	System level evaluation results for E-LMMSE-IRC with interference estimation enhancement	Panasonic	

The document was presented by Michael Einhaus from Panasonic and proposes that ZP-DMRS should be considered as a strategy for coordinating the DMRS transmissions of mutually interfering cells.
Decision: The document is noted.

R1-140266	System level evaluation results for ML receiver	ZTE	

The document was presented by Huaming Wu from ZTE and concludes that ML can provide significant gains for the cell-edge and average user throughput with network assistance/coordination.
Decision: The document is noted.

Update the excel table to include all results in this meeting until Friday – Jeff (Mediatek)

Not treated.

R1-140059	Further system level evaluations for SLIC receiver	Huawei, HiSilicon	
R1-140137	System-level performance evaluation of R-ML/ML receivers with and without signalling assistance	Intel Corporation	
R1-140247	Further system level results on R-ML receivers	MediaTek Inc.	
R1-140265	System level evaluation results for SLIC receiver	ZTE	
R1-140397	System level evaluation of SLML receiver for NAICS scenario 1	Samsung	
R1-140398	System level evaluation of SLML receiver for NAICS scenario 2	Samsung	
R1-140631	Evaluation results on symbol-level IC for Rel-12 NAICS	NTT DOCOMO	
R1-140803	System level evaluations for NAICS	Ericsson	
R1-140887	System level evaluation results for SLIC	LG Electronics	

7.2.9.2 Network assistance signalling – feasibility and performance impact

R1-140576	Network assistance for advanced receivers	NSN, Nokia	

The document was presented by Mihai Enescu from NSN and the following general observations can be drawn:

- If dynamic signalling is introduced, a new DCI format seems appropriate.
- Broadcast dynamic signalling from the interfering cell is one solution scaling across all NAICS scenarios.
- Higher layer signalling needs to rely to a large extent on blind UE processing while does not necessarily reduces the UE complexity.
- There is a trade-off in UE complexity when considering a) increased blind decoding of NAICS DCI at the benefit of robust interference characteristics vs. b) increased blind estimation of interference characteristics without the aid of signalling.

Discussion: Huawei → performances linked to broadcast dynamic signalling is an issue to be considered.
Decision: The document is noted.

R1-140138	Discussion on network signalling for NAICS receivers	Intel Corporation	

The document was presented by Alexei Davydov from Intel and deals with two mechanisms for network signalling assistance of the NAICS receiver. The first mechanism relies on backhaul link signalling between eNBs to provide information about parameters of interfering signals to the victim UEs using semi-static signalling. The second approach is based on the dynamic signalling of interfering signal parameters directly from the aggressor eNB.
For each signalling mechanisms some examples of the parameters (both semi-static and dynamic) of the interfering signals were provided. Using link-level simulations the initial study on feasibility of the dynamic parameter signalling from interfering cells is provided. However, further study on the need of dynamic signaling assistance should be conducted by RAN1/4 with consideration of the tradeoffs between receiver complexity, performance gain and signaling overhead. For semi-static signalling the impact of the PRB bundling, hoping and power boosting restrictions on interfering cell should be also investigated.

Decision: The document is noted.

R1-140804	On network assisted signalling and coordination for NAICS	Ericsson	

The document was presented by Lars Lindbom from Ericsson and is summarized as:

- Proposal 1: Any network assisted signalling for NAICS should be applicable to a vast range of network operation scenarios within both homogeneous and heterogeneous deployments, including shared cell operations
- Proposal 2: Interference parameters that can be acquired via blind detection without any network assistance are:
  - Modulation order, precoder, rank/DMRS ports, TM
  - Cell ID, CP, n_s, CRS antenna ports, MBSFN configuration, system bandwidth
- Proposal 3: Information on interference parameters provided by a serving cell are signalled via higher layer
- Observation 1: NAICS receivers can easily support TM10 and its virtual cell ID functionality with proper assistance signalling
- Proposal 4: Serving cell provides information that limits the number of DMRS hypothesis
- Observation 2: The UE-specific RS can be used to detect the presence of PDSCH interference when the interference is associated with DMRS based transmission modes
- Proposal 5: FFS if some network assistance and/or coordination are beneficial for reliable detection of PDSCH interference presence when the interference is associated with CRS based transmission modes
- Proposal 6: Consider coordination of interference parameters related to DL power allocations, and possibly signal a set of power allocations that the UE should consider when cancelling/suppressing interferers

Decision: The document is noted.

R1-140060	Discussion on network assistance signalling for NAICS receivers	Huawei, HiSilicon	

The document was presented by Jianghua Liu from Huawei and proposes:

Proposal 1: Higher-layer signalling from serving cell with network coordination and dynamic implicit signalling from interference cell are preferred for interference transmission parameters which need to be signalled; dynamic/higher-layer signalling from interference cell may be excluded for NAICS.

Proposal 2:

- Parameters are predefined with a certain value: CFI/PDSCH start symbol.
- Parameters may be signalled by higher-layer signalling from serving cell with/without network coordination: P_B, P_A, transmission mode, resource allocation, scrambling identity and DMRS antenna port, n_{ID}^{DMRS}.
- Parameters may be implicitly signalled from interference cell: Modulation order.
- Parameters may be blindly detected with the performance-complexity evaluation in RAN4: P_B, P_A, transmission mode, PMI, RI, modulation order, scrambling identity and DMRS antenna port.

Proposal 3: Further evaluation in RAN4 is necessary to achieve a better trade-off between the feasible signalling methods and acceptable performance-complexity of UE blind detection.

Decision: The document is noted.

R1-140341	Discussion on broadcasting dynamic network assistance information	LG Electronics	

The document was presented by Hyungtae Kim from LGE and proposes:

- Proposal 1: the serving cell of victim UE should provide semi-static NA information through RRC signaling, and the interfering cell should provide dynamic NA information through PDCCH/ePDCCH.
- Proposal 2: PMI and modulation order should be signaled and CFI and PA can be semi-statically coordinated, and other dynamic NA information should be signaled unless BD is feasible.
- Proposal 3: A new C-RNTI for CRC masking of the A-DCI should be introduced and should be given to victim UE by RRC signaling.
- Proposal 4: Alt 1 (A-DCI per NA information type) and Alt 2 (A-DCI per interfering cell's PDSCH) should be considered as possible assistance DCI.
- Proposal 5: Further study is needed on what aggregation level is reasonable in consideration of PDCCH capacity and coverage for signaling NA information from interfering cell.

Decision: The document is noted.

R1-140893	Performance impact of network assistance signalling for NAICS	Samsung	(R1-140399)

The document was presented by Hyojin Lee from Samsung and states that network-assistance signaling for NAICS should be supported in Rel-12 to achieve system performance gains and to avoid additional UE complexity

Decision: The document is noted.

Not treated.

R1-140178	Considerations on network signalling for NAICS	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140248	Discussion on the feasibility of network assistance	MediaTek Inc.	
R1-140267	Network assistance signalling for NAICS	ZTE	
R1-140476	Network assistance signalling	Qualcomm Inc.	
R1-140509	Feasibility of dynamic assistance signalling and blind parameter detection	Panasonic	
R1-140577	TP for network assistance in NAICS	NSN, Nokia	
R1-140614	Signalling in NAICS	Broadcom Corporation	

7.2.9.3 Network coordination – feasibility and performance impact

R1-140249	Discussion on the feasibility of network coordination and performance impact	MediaTek Inc.	

The document was presented by Jeff Zhuang from MediaTek and proposes that network coordination on CFI alignment, TM, and RA granularity/type can be considered for higher-layer signalling as well, because such coordination and signalling can reduce the receiver complexity significantly.
Decision: The document is noted.

R1-140061	Discussion on network coordination for advanced receivers	Huawei, HiSilicon	

The document was presented by Jianghua Liu from Huawei and proposes:
Proposal 1: UE receiver detection may be facilitated by network coordination from neighbouring cells, which include:
- UE with advanced receiver capability may assume that the transmission mode of interference cells is TM2 or TM9.
- UE may assume that the value of P_A of interference signal on coordinated resource is same for TM2.
- UE may assume that resource allocation type 0 is used in the interference cells and PRB bundling is applied on the coordinated resource for TM9.
- UE may assume the coordinated DMRS port configuration is used in the interference cells.

Proposal 2: Further study and achieve agreements on the following open issues are needed in SI stage:
- Study on necessity and feasibility of network coordination/signalling for CWIC.
- Study on how UE determines the interference signals to be eliminated.
- Study and evaluate on the impact of UE timing synchronization of interference cells.
- Study/agree on the evaluation methodology of impairment modelling in order to align the simulation results.

Decision: The document is noted.

Not treated.

R1-140179	Considerations on network coordination for NAICS	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-140268	Network coordination for NAICS	ZTE	
R1-140342	Discussion on network coordination for NAICS	LG Electronics	
R1-140400	Discussion on network coordination for NAICS	Samsung	
R1-140477	Network coordination for NAICS	Qualcomm Inc.	
R1-140578	On the NAICS network operation	NSN, Nokia	

7.2.9.4 Other

Not treated.

R1-140139	NAICS receivers for downlink control channel	Intel Corporation	
R1-140220	On DMRS based interference cancellation receiver and its signalling	ETRI	
R1-140343	Discussion on CQI calculation methods for NAICS	LG Electronics	

R1-140894	NAICS RAN1 & RAN4 joint Ad-Hoc discussion on possible SI conclusions	MediaTek Inc.	

The document was presented by Jeff Zhuang from MediaTek.
Discussion: Broadcom questioned whether the intention was to agree all the content (in particular slide 3) as this was not the understanding from the ad-hoc session
ALU → concern with the cost/complexity w.r.t Dynamic signaling (last slide).
Decision: The document is noted.

Agreement:
- Further investigation of CSI enhancement is needed in order to ensure that NAICS receivers can achieve a user throughput gain
- Higher-layer signaling of parameters related to interference PDSCH could be beneficial to reduce the blind detection complexity or performance degradation
  - It is not precluded at yet that some of the following candidate parameters may be blindly detected
  - Candidate parameters for higher-layer signaling for further study both in RAN1 and RAN4 include
    - Resource allocation granularity (e.g., a group of PRB or PRB pairs)
    - RA type (e.g., type 0, LVRB, N_{gap} used for DVRB)
    - System bandwidth
    - Synchronization indication (e.g., CP length)
    - CSI-RS configuration
    - QCL
    - Cell-ID
    - CRS ports
    - MBSFN pattern
    - ρ_B/ρ_A
- For the following parameters of interference PDSCH, UE blind detection is desirable to reduce scheduling restriction and signaling overhead, possibly detected from a reduced subset (e.g., RRC signaled) of all values for some parameters
  - Presence or absence of interference
  - TM
  - For DMRS-based TMs: DMRS ports, modulation order, Virtual cell ID, nSCID, Cell ID, CRS ports, and MBSFN pattern
  - For CRS-based TMs: PMI, RI, modulation order, Cell ID, CRS ports, and MBSFN pattern, ρ_A
  - CFI (if not coordinated and required by receiver implementation)

Agreement:
- Dynamic signaling from an interference or a serving cell can be evaluated after conclusions on blind detection, conditions and assumptions including the physical channel and assumed content can be further discussed

Ericsson: Excel sheet shows results from different companies under different simulation assumptions → may be good to provide those differences if the excel sheet is going to be captured in the TR – assumptions sheet may be simply removed from the excel file and only deviations from these assumptions should be clearly stated.

Update TR capturing above agreements until Friday – Jeff (Mediatek)
Friday 14th

R1-140955	36.866 v1.2.0 on NAICS for LTE	MediaTek Inc.	

The document was presented by Jeff Zhuang from MediaTek.
Discussion: Orange concern with first bullet in section 11 "Conclusions"
- Further investigation of CSI enhancement is needed in order to ensure that NAICS receivers can achieve a user throughput gain

May be better to just mention "Further investigation of CSI enhancement is needed".
Mediatek suggested "Further investigation of CSI enhancement is needed in order to ensure that NAICS receivers can achieve a further user throughput gain" – ALU "further" is unclear what the meaning is
Further investigation of CSI enhancement is needed
in order to help to ensure that NAICS receivers can achieve a user throughput gain
Qualcomm → move the bullet at the end of the section
Samsung: still the interpretation of this bullet may have different meaning
Decision: The document is noted and is for email approval until 19th February with the following update – MCC

The following conclusions were made ~~in RAN1#76~~:

- Higher-layer signaling of parameters related to interference PDSCH could be beneficial to reduce the blind detection complexity or performance degradation
  - It is not precluded at yet that some of the following candidate parameters may be blindly detected
  - Candidate parameters for higher-layer signaling for further study both in RAN1 and RAN4 include
    - Resource allocation granularity (e.g., a group of PRB or PRB pairs)
    - RA type (e.g., type 0, LVRB, N_{gap} used for DVRB)
    - System bandwidth
    - Synchronization indication (e.g., CP length)
    - CSI-RS configuration
    - QCL
    - Cell-ID
    - CRS ports
    - MBSFN pattern
    - ρ_B/ρ_A
- For the following parameters of interference PDSCH, UE blind detection is desirable to reduce scheduling restriction and signaling overhead, possibly detected from a reduced subset (e.g., RRC signaled) of all values for some parameters
  - Presence or absence of interference
  - TM
  - For DMRS-based TMs: DMRS ports, modulation order, Virtual cell ID, nSCID, Cell ID, CRS ports, and MBSFN pattern
  - For CRS-based TMs: PMI, RI, modulation order, Cell ID, CRS ports, and MBSFN pattern, ρ_A
  - CFI (if not coordinated and required by receiver implementation)
- Dynamic signaling from an interference or a serving cell can be evaluated after conclusions on blind detection, conditions and assumptions including the physical channel and assumed content can be further discussed
- Further investigation of CSI enhancement is needed in order to help to ensure that NAICS receivers can achieve a user throughput gain

8 Closing of the meeting

3GPP Excellence Award (further to 2012 leadership decision to recognise the very best individual for their contributions to current work within 3GPP).
Mr Chair emphasized the decision made by the Awards Panel (the four TSG Chairmen) to award once again RAN1 delegate and congratulated the second winner of the 3GPP Excellence Award, Mr Robert Love from Motorola Mobility. This award is in recognition to Robert's outstanding contribution to 3GPP through many many years, for his tremendous effort as a rapporteur of one of the most complicated specification, namely TS36.213 "E-UTRA Physical layer procedures".

Mr Chair then expressed his thanks to RAN1 Vice Chairmen, as well as Carmela Cozzo and Karri Ranta-aho for chairing parallel HSPA sessions and to the Secretary Patrick Merias for his efficient support.

Finally, Mr Chair wished a safe journey back home to all and closed the meeting at 17:05.
See you all in Shenzhen.

Annex A: List of Tdocs at RAN1 #76

Please see excel file attached to this report

Annex B: List of CRs agreed at RAN1 #76

TS	CR	Rev	Rel	Title	Cat	Vsn	TD#	Source to WG	Work Item	Clauses affected
25.212	0322	-	Rel-7	Correction to HS-SCCH special information mapping for HS-SCCH less HSDPA	F	7.11.0	R1-140835	NSN	RANimp-CPC	4.6A.2.2.1
25.212	0323	-	Rel-8	Correction to HS-SCCH special information mapping for HS-SCCH less HSDPA	A	8.7.0	R1-140900	NSN	RANimp-CPC	4.6A.2.2.1
25.212	0324	-	Rel-9	Correction to HS-SCCH special information mapping for HS-SCCH less HSDPA	A	9.5.0	R1-140901	NSN	RANimp-CPC	4.6A.2.2.1
25.212	0325	-	Rel-10	Correction to HS-SCCH special information mapping for HS-SCCH less HSDPA	A	10.4.0	R1-140902	NSN	RANimp-CPC	4.6A.2.2.1
25.212	0326	-	Rel-11	Correction to HS-SCCH special information mapping for HS-SCCH less HSDPA	A	11.6.0	R1-140903	NSN	RANimp-CPC	4.6A.2.2.1
25.214	0711	1	Rel-10	Clarification on (de-)activation status of secondary carriers when higher layer indicates a change of HS-DSCH cells	F	10.7.0	R1-140910	Huawei, HiSilicon, NSN, Ericsson	4C_HSDPA-Core	6A.1
25.214	0712	1	Rel-11	Clarification on (de-)activation status of secondary carriers when higher layer indicates a change of HS-DSCH cells	A	11.7.0	R1-140911	Huawei, HiSilicon, NSN, Ericsson	4C_HSDPA-Core	6A.1
25.701	0007	-	Rel-12	Inclusion of Scalable Bandwidth UMTS by filtering and by chip-zeroing	B	12.0.0	R1-140909	NSN	FS_UTRA_SCAL	
36.211	0187	-	Rel-12	On PMCH starting symbol in an MBSFN subframe	C	12.0.0	R1-140412	Intel, Samsung, NEC, Panasonic, BlackBerry	LTE-Phys	6.5
36.213	0447	-	Rel-12	Correction to CSI Reporting	F	12.0.0	Form-v10	Panasonic	LTE-Phys	7.2
36.213	0448	-	Rel-12	Clarification on PUCCH Mode 1-1 for 4Tx Dual Codebook	F	12.0.0	R1-140782	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Rohde&Schwarz	LTE_eDL_MIMO_enh-Core	7.2.2
36.213	0449	1	Rel-11	Common search space monitoring for MBMS	F	11.5.0	R1-141035	Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, AT&T, Panasonic	MBMS_LTE	9.1.1
36.213	0450	1	Rel-12	Common search space monitoring for MBMS	A	12.0.0	R1-141036	Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, AT&T, Panasonic	MBMS_LTE	9.1.1
36.213	451	-	Rel-11	Introduction of new UE categories	F	11.5.0	R1-140869	Ericsson	LTE_CA_enh-Core	7.1.8
36.213	452	-	Rel-12	Introduction of new UE categories	A	12.0.0	R1-140870	Ericsson	LTE_CA_enh-Core	7.1.8
36.213	0453	1	Rel-10	Modification to I_SRS = 0 for trigger type 1 SRS and TDD.	C	10.11.0	R1-141044	Qualcomm Inc., Huawei, HiSilicon, Fujitsu, BlackBerry, LG Electronics, CATT, Nokia, NSN	LTE_UL_MIMO-Core	8.2

TS	CR	Rev	Rel	Title	Cat	Vsn	TD#	Source to WG	Work Item	Clauses affected
36.213	0454	1	Rel-11	Modification to I_SRS = 0 for trigger type 1 SRS and TDD.	A	11.5.0	R1-141045	Qualcomm Inc., Huawei, HiSilicon, Fujitsu, BlackBerry, LG Electronics, CATT, Nokia, NSN	LTE_UL_MIMO-Core	8.2
36.213	0455	1	Rel-12	Modification to I_SRS = 0 for trigger type 1 SRS and TDD.	A	12.0.0	R1-141046	Qualcomm Inc., Huawei, HiSilicon, Fujitsu, BlackBerry, LG Electronics, CATT, Nokia, NSN	LTE_UL_MIMO-Core	8.2
36.213	0457	-	Rel-11	Correction to CSI processing in TM10	F	11.5.0	R1-141058	Intel Corporation, Huawei, HiSilicon	COMP_LTE_DL-Core	7.2.1
36.213	0458	-	Rel-12	Correction to CSI processing in TM10	A	12.0.0	R1-141059	Intel Corporation, Huawei, HiSilicon	COMP_LTE_DL-Core	7.2.1

Annex C-1: List of Outgoing LSs from RAN1 #76

R1	Response to (Ic LS)	To	Cc	Title	Contact	Ref'd /Attachd Tdoc	Release	WI
R1-140898		R2	RAN	LS on introduction of new UE categories	Huawei, Ericsson	R1-140869, R1-140868	Rel-11	LTE_CA_enh-Core
R1-140905		R2, R3		Decoupling of E-DCH and HS-DSCH serving cell in UMTS HetNet	NSN		Rel-12	UTRA_hetnet_enh-Core
R1-140906		R2		LS on Enhanced Broadcast of System Information	Ericsson		Rel-12	UTRA_SIBenh
R1-140941	S3-131152 (R1-140017)	S3	R2, S2	Response LS on parameter synchronization	Qualcomm Inc.		Rel-12	FS_LTE_D2D_Prox
R1-140950	S2-140560	RAN	R2, R3, R4, SA, S2	Reply LS on ProSe Out of Coverage discovery	Ericsson		Rel-12	FS_LTE_D2D_Prox
R1-140985		R4		LS on impact on RRM measurements of P-CPICH scaling for Filtered UMTS	AT&T		Rel-12	FS_UTRA_SCAL_FILT
R1-141007	R2-134603 (R1-140006)	R2		Response LS on Random Access in dual connectivity	NEC, LGE		Rel-12	LTE_SC_enh_dualC-Core
R1-141008		R2, R4		LS on RAN1 working assumption on dual connectivity	NTT DoCoMo		Rel-12	LTE_SC_enh_dualC-Core
R1-141021		R2, R3, R4		LS on small cell on/off and discovery	Huawei		Rel-12	LTE_SC_enh_L1-Core
R1-141025		R2		LS on handling of subframe #6 in LTE_TDD_eIMTA	CATT		Rel-12	LTE_TDD_eIMTA-Core
R1-141029	R2-134596 (R1-140005)	R2	R4, RAN	Reply to LS on mobility support for LC MTC UEs and MTC coverage enhancement	Vodafone Group		Rel-12	LC_MTC_LTE-core
R1-141033		R2, R3		LS on Identification of TBS/bandwidth limited UE by eNB	Alcatel-Lucent		Rel-12	LC_MTC_LTE-core
R1-141048		R3	RAN	LS on Inter-eNB CoMP for LTE	Samsung		Rel-12	COMP_LTE_IeNB
R1-140904		R2		E-DPCCH to indicate TTI Switching	Qualcomm Inc.		Rel-12	EDCH_enh
R1-141065		R2		LS on RAN1 TDD-FDD CA status and related RRC impact	Nokia		Rel-12	LTE_CA_TDD_FDD
R1-141066		R2		LS on RRC parameters for LTE_TDD_eIMTA	CATT		Rel-12	LTE_TDD_eIMTA

Annex C-2: List of Incoming LSs from RAN1 #76

Source	Original Tdoc nbr	RAN1 Tdoc nbr	To	Cc	Title	Response to (Ic LS)	Release	WI	Contact
R2	R2-134486	R1-140003	S4	S2, R1	Reply LS on the UE capabilities regarding support of simultaneous MBMS bearer reception	S4-131406 (R2-133760)	Rel-12	MI-EMO	Samsung
R2	R2-134590	R1-140004	R1		LS on text proposal for TR 36.843 on D2D		Rel-12	FS_LTE_D2D_Prox	Qualcomm
R2	R2-134596	R1-140005	R1	R4	Reply LS on mobility support for Low Complexity MTC UEs and MTC coverage enhancement	R1-134954 (R2-133758)	Rel-12	LC_MTC_LTE-core	Vodafone
R2	R2-134603	R1-140006	R1		LS on Random Access in dual connectivity		Rel-12	FS_LTE_SC_enh_hilayer	NEC
R4	R4-137081	R1-140007	RAN ITU-R Ad Hoc	R1, R2, R3, R5	3GPP RAN WG4 input to update submission for IMT-2000 CDMA DS and IMT-2000 CDMA TDD toward Rev. 12 of Rec. ITU-R M.1457 "Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2000 (IMT-2000)"	(R4-136884)	-	-	Telecom Italia
R4	R4-137102	R1-140008	R1		LS response on D2D Typical UE in-band Emissions	R1-133986	Rel-12	FS_LTE_D2D_Prox	Ericsson
R4	R4-137156	R1-140009	ECC PT1	R1	Reply LS on Synchronization aspects in LTE-TDD networks	(R4-135561)	-	-	Huawei, NSN
S1	S1-135308	R1-140010	R1		Reply to LS on notifying for information of including Annex about Public Safety ProSe Communication in TR 36.843		Rel-12	FS_LTE_D2D_Prox	Telecom Italia
S2	S2-134580	R1-140011	R1, R2		Further questions on GCSE with eMBMS		Rel-12	GCSE_LTE	Vodafone
R2	R2-134582	R1-140012	R1		Reply LS on FDD-TDD switching enhancement in FDD-TDD joint operation	R1-134960	Rel-12	LTE_CA_TDD_FDD-Core	CMCC
R2	R2-134591	R1-140013	R1, S1, S2, S3		LS on discovery message size	R1-134957 (R2-133747)	Rel-12	FS_LTE_D2D_Prox	Qualcomm
R2	R2-134594	R1-140014	S2	R1, R3, R4	Response LS on GCSE with eMBMS	S2-133846 (R2-133066)	Rel-12	FS_LTE_GC	Alcatel Lucent
RAN	RP-132107	R1-140015	S3, S3-LI, S2	R1, R2, R3, SA, S1	Reply LS on ProSe Lawful Interception	R1-134923 (RP-131413)	Rel-12	FS_LTE_D2D_Prox	Telecom Italia
RAN	RP-132109	R1-140016	S2	R1, R2	Response to LS on Further questions on GCSE with eMBMS	S2-134580	Rel-12	GCSE_LTE	Vodafone
S3	S3-131152	R1-140017	R1	S2, R2	LS on parameter synchronization		Rel-12	FS_LTE_D2D_Prox	Qualcomm
S1	S1-140319	R1-140181	R1		Reply LS on D2D proximity criteria	R1-136067 (S1-140144)	Rel-12	FS_LTE_D2D_Prox	Telecom Italia
S2	S2-140494	R1-140182	RAN	S3, S3-LI, R1,R2, R3, SA, S1	Reply LS on ProSe Lawful Interception	RP-132107 (S2-140049)	Rel-12	FS_LTE_D2D_Prox	Qualcomm
S2	S2-140511	R1-140183	S4	R1, R2	Reply LS on the UE capabilities regarding support of simultaneous MBMS bearers	S4-131406 (S2-140036)	Rel-12	MI-EMO	Samsung
S2	S2-140560	R1-140184	RAN, R1, R2, R3, R4	SA	LS on ProSe Out of Coverage discovery		Rel-12	FS_LTE_D2D_Prox	Deutsche Telekom
S2	S2-140568	R1-140185	R2, R1, S1, S3		LS reply on discovery message size	R2-134591 (S2-140046)	Rel-12	FS_LTE_D2D_Prox	Alcatel Lucent, Intel
S3	S3-140226	R1-140186	R2	R1, S1, S2	Reply to LS on discovery message size	R2-134591	Rel-12	FS_LTE_D2D_Prox	Qualcomm

Source	Original Tdoc nbr	RAN1 Tdoc nbr	To	Cc	Title	Response to (Ic LS)	Release	WI	Contact
R3	R3-140490	R1-141050	R1, R2		LS on Text Proposal for TR 36.843		Rel-12	FS_LTE_D2D_Prox	Qualcomm
R2	R2-141009	R1-141051	R1		LS on Text Proposal for TR 36.843 on D2D		Rel-12	FS_LTE_D2D_Prox	Qualcomm
R4	R4-140969	R1-141053	R1		Reply LS on Multiple Access Scheme for D2D	R1-134886	Rel-12	FS_LTE_D2D_Prox	Qualcomm
R4	R4-141241	R1-141054	R1		Reply LS on AGC and Frequency Error for D2D	R1-134930	Rel-12	FS_LTE_D2D_Prox	Qualcomm, Ericsson

Annex D: List of Approved updated WIDs

None

Annex E: List of draft TSs/TRs agreed at RAN1 #76

Tdoc Number	Title	Source	Conclusion/Decision
R1-140933	TR 36.843 v1.0.1 on Study on LTE Device to Device Proximity Services	Qualcomm Inc.	Endorsed
R1-141052	36.866 v1.2.1 on NAICS for LTE	MediaTek Inc.	Agreed
R1-141057	36.866 v2.0.0 on NAICS for LTE	MediaTek Inc.	Endorsed
R1-141061	TR 36.843 v1.2.0 on Study on LTE Device to Device Proximity Services	Qualcomm Inc.	Agreed
R1-141062	TR 36.873 V1.3.0 on Study on 3D channel model for LTE	NSN	Agreed

Annex F: List of actions

- **Outgoing LS.**

[76-31] Arjun Bharadwaj, Qualcomm

R1-140904	LS to RAN2 E-DPCCH orders to indicate TTI switching	Qualcomm	

Email approval until 28th February
Done: The LS is agreed as per email decision dated March 9th.

- **CR approval**

[76-01] Alexei Davydov, Intel

R1-141031	36213 CRxxxx (Rel-11, F) Correction to CSI processing in TM10	Intel Corporation, Huawei, HiSilicon	

Email approval until 21st February
Done: .According to Mr Chair's decision made on Feb 24th, the CR is agreed as CR0457 in R1-141058. In addition, shadow CR to Rel-12 is agreed as CR0458 in R1-141059.

[76-30] Wang Fan, Huawei

R1-140678	25.214 CR0711 (Rel-10, F) Clarification on (de-)activation status of secondary carriers when higher layer indicates a change of HS-DSCH cells	Huawei, HiSilicon	

Email review until Friday, 21st February
Done: .According to Mr Chair's decision made on Feb 27th, revision 1 of the Rel-10 CR (resp. Rel-11 CR) is agreed in R1-140910 (resp. R1-140911).

[76-37] Karri Ranta-aho, NSN
Scalable BW UMTS Package CR to TR25.701 compiling the agreed changes to a single CR,
Email approval until 25th February
Done: .According to Mr Chair's decision made on Feb 27th, CR is agreed as follows:

R1-140909	25.701 CR0007 (Rel-12, B) Inclusion of Scalable Bandwidth UMTS by filtering and by chip-zeroing	NSN	

- **Text proposal for TS and TR**

[76-18] Saurabha Tavildar, Qualcomm

R1-141043	Text Proposal for TR 36.843 with for D2D Evaluation Results	Qualcomm Incorporated (Rapporteur)	(R1-141034)

Email approval until 19th February

Done: The final TP is agreed in R1-141056, according to Mr Chair's decision on Feb 20th.

[76-19] Saurabha Tavildar, Qualcomm

R1-140944	DraftTR 36.843 v1.2.0 on Study on LTE Device to Device Proximity Services	Qualcomm Inc.	

Email approval until 20th February

Done: . Final TR is agreed in R1-141061 as version 1.2.0 (email decision of Feb 25th), including the following open issues listed in conclusion:

- **Contents of discovery MAC PDU. (Relevant only to discovery)**
- **Impact on cellular traffic.**
- **Impact on other operator spectrum.**
- **Lawful interception impact on RAN if any.**
- **Potential impact on inter-eNodeB interfaces**

[76-20] Patrick Merias

R1-141052	36.866 v1.2.1 on NAICS for LTE	MediaTek Inc.	(R1-140955)

Email approval until 19th February

Done: . Final TR is agreed in R1-141057 as version 2.0.0 (email decision of Feb 20th)

[76-32] Thomas Chapman, Ericsson

R1-140986	Link level simulation assumptions for Scalable UMTS	Ericsson	(R1-140908)

Email approval until 25th February

Done: According to Mr Chair's decision on Feb 26th, final TP is agreed.

[76-33] Arjun Bharadwaj, Qualcomm

R1-140984	TP on Simulation Results for Scalable UMTS with Filtering	Qualcomm	

TP based on WF R1-140948 for scalable UMTS for email approval until 25th February

Done: According to Mr Chair's decision on Feb 26th, final TP is agreed.

[76-34] Arjun Bharadwaj, Qualcomm and Thomas Chapman, Ericsson

Scalable BW UMTS open issues list for status report

Email approval until 25th February

Done: According to Mr Chair's decision on Feb 28th, the following open issues are agreed for inclusion in the Status Report:

- **Uplink**
  - **Performance evaluation and identifying the differences between pure filtering and chip-zeroing**
    - **Discussion and agreement on appropriate UL operation scenario**
  - **PRACH preamble code design and performance**
  - **Evaluation of PAPR aspects although it is expected that there would not be an impact.**

- **Downlink**
  - **Downlink N=4 standalone performance including SCH**
  - **Potential bandwidth detection optimization which may result in a change on SCH design**
- **RAN2 and RAN4 have not been consulted on any aspects within their scope related to FUMTS. RAN1 does not have the expertise to assess these aspects even though some contributions were submitted on these topics..**

[76-35] Arjun Bharadwaj, Qualcomm

R1-140946	Enhanced Filtering for Scalable UMTS	QUALCOMM Incorporated, [Huawei, Ericsson, NSN, ALU]	

Email approval until 25th February
Done: According to Mr Chair's decision on Feb 26th, final TP is agreed in R1-140989.

R1-140989	Enhanced Filtering for Scalable UMTS	QUALCOMM Incorporated	(R1-140946)

[76-36] Arjun Bharadwaj, Qualcomm

R1-140988	TP on conclusions	QUALCOMM Incorporated, Huawei, HiSilicon, NSN, China Unicom	(R1-140949)

Email approval until 25th February
Done: According to Mr Chair's decision on Feb 26th, TP on conclusions of Scalable UMTS with Filtering is agreed.

- **Miscellaneous**

[76-10] Zukang Shen, CATT
Open issues for eIMTA
Email discussion/approval until 19th February
Done: The identified open issues are agreed in R1-141055, according to Mr Chair's decision on Feb 20th.

[76-02] Zukang Shen, CATT
Aperiodic CSI in TM1-9 for eIMTA
Email discussion until 21st February
Done: According to Mr Chair's decision made on Feb 24th, no consensus is acchieved and there is no more RAN1 meeting time left to eIMTA. The email discussion outcomes are reported in

R1-141060	Summary of email discussion [76-02]	CATT	

[76-03] David Mazzarese, Huawei
Aperiodic CSI in TM10 for eIMTA
Email discussion until 28th February
Done: According to Mr Chair's decision made on Mar 21st , the following is agreed as working assumption:
- **Minimum UE capability on the number of CSI processes for TDD eIMTA is one**
- **For a Rel-12 UE configured with TDD eIMTA and capable of one CSI process, up to two Rel-11 CSI-IM resources is supported for one CSI process.**
  - **FFS between the following approaches to support this:**

- One Rel-12 CSI-IM resource is defined to contain up to two Rel-11 CSI-IM resources, i.e. one or two sets of *{resourceConfig, subframeConfig}*
- One Rel-12 CSI process is defined to contain up to two CSI-IM resources, i.e. one or two *CSI-IM-ConfigId*
- Other approaches are not precluded

  - other details FFS (e.g. possible association of CSI-IM resource to subframe set, details of aperiodic CSI triggering)

- FFS whether this new configuration is supported by Rel-12 UEs without eIMTA capability or Rel-12 UE with eIMTA capability not configured with TDD eIMTA
- FFS whether this new configuration is also supported for 2, 3 and 4 configured CSI processes
- For aperiodic CSI reporting in transmission mode 10 for a single serving cell when the UE is configured with 1 CSI process, only CSI for one subframe set is reported in any subframe.

[76-04] Alexei Davydov, Intel

R1-141041	Way Forward on Periodic CSI Reporting for eIMTA	Intel, LGE, Qualcomm	

Email discussion until 21st February

Done: According to decision made on March 16th , the following is agreed ~~as working assumption~~:

- **For eIMTA capable UEs the CSI measurement subframe set index is used to determine CSI priority for collision handling in periodic CSI reporting**
- **The priority for CSI reporting is defined as follows:**
  - **CSI reporting type > CSI process > CC index > CSI subframe index**
  - **CSI subframe index 0 > CSI subframe index 1**

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[76-05] Chao Wei, Qualcomm

R1-141041	Way Forward on Periodic CSI Reporting for eIMTA	Intel, LGE, Qualcomm	

Periodic CSI for flexible DL subframe for eIMTA for email discussion until 28th February

Done: According to decision made on March 8th , the following is agreed as working assumption:

- **For UEs configured with eIMTA, for periodic CSI report in subframe n, the corresponding CSI reference resource is determined by the existing definition for TM 1 – 10 (in TS36.213 section 7.2.3), with the following additions:**
  - **If the eIMTA UE receives a valid UL-DL configuration for a radio frame via a reconfiguration DCI, the DL and special subframes according to the indicated UL-DL configuration in the radio frame can be valid CSI reference resources**
  - **If the eIMTA UE does not receive a valid UL-DL configuration for a radio frame via a reconfiguration DCI, the DL and special subframes according to the SIB-1 UL-DL configuration in the radio frame can be valid CSI reference resources**
  - **FFS if the eIMTA UE can omit reporting the periodic CSI or report OOR under certain conditions, and the corresponding conditions are also FFS**

[76-06] Timo Lunttila, NSN

EPDCCH scheduling for eIMTA for email discussion until 28th February

Done: According to decision made on March 16th , the following way forward is agreed.

R1-141064	Way Forward on issues related EPDCCH scheduling for eIMTA (in email discussion [76-06])	NSN	

[76-07] Zukang Shen, CATT
R1-141026 HARQ-ACK feedback with PUCCH format 3 for eIMTA
Email discussion until 21st February
Done: No consensus by email discussion deadline. Off line discussion will continue and status be checked in RAN1#76bis.

[76-08] Aris Papasakellariou, Samsung
HARQ-ACK on PUSCH for eIMTA
Email discussion until 21st February
Done: As per decision made on February 27th, a summary is available as:

R1-141063	Summary of email Discussions on HARQ-ACK on PUSCH for eIMTA	Samsung	

[76-09] Zukang Shen, CATT
RRC parameter list for eIMTA for email approval until 14th March
Done: As per decision made on March 19th, the final agreed LS to RAN2 is in R1-141066.

[76-11] Gustav Vos, Sierra Wireless
Scheduling option for low cost MTC
Email discussion until 14th March
Done: Status to be checked in RAN1#76bis.

[76-12] Joon Kui Ahn, LG Electronics
DCI format for TDD-FDD CA
Email discussion/approval until 19th February and after that, email discussion/approval until 21st February
Done: According to Mr Chair's decision on Feb 27th, the following is agreed:

- **1 bit SRS request field in DCI format 2B/2C/2D (if aperiodic SRS is configured) exists only when TDD SCell is a scheduled cell regardless whether the scheduling cell is TDD or FDD.**
- **If both PCell and the scheduled SCell use FDD:**
  - **DL DCI and UL DCI formats: no UL index, no UL DAI, no DL DAI**
  - **DL DCI formats include 3-bit HARQ process number field**
- **If TDD PCell is supported, when PCell uses TDD and the scheduled SCell uses FDD:**
  - **DL DCI formats include 2-bit DL DAI and 4-bit HARQ process number field**
  - **UL DCI formats include 2-bit UL DAI**
  - **No UL index field exists in UL DCI formats**
- **For other cases,**
  - **Option B as working assumption for FDD PCell case**
  - **Option B as working assumption for TDD PCell case, if TDD PCell self-scheduling is supported**

[76-13] Klaus Hugl, Nokia

RRC parameter list for TDD-FDD CA for email approval until 14th March
Done: As per decision made on March 19th, it is agreed that RAN1 Rel-12 TDD-FDD CA design requires the UE to support simultaneous RX and TX (i.e. full-duplex) for the indicated TDD-FDD CA band combinations. This is reflected in final agreed LS to RAN2 in R1-141065.

[76-14] Havish Koorapaty, Ericsson

R1-141015	Way Forward on Transition Time Reduction for Small Cell On/Off	Ericsson, Qualcomm	

Email discussion until 14th March
Done: According to email's decision on March 21st, no conclusion can be drawn. Nervertheless, some proposal of new L1 procedures to further reduce the transition time might be considered as guideline for study/clarification in the next meeting.

[76-15] Bishwarup Mondal, NSN

R1-141062	TR 36.873 V1.3.0 on Study on 3D channel model for LTE	NSN	

TR36.873 update for 3D-channel model
Email discussion until 21st February
Done: TR version 1.3.0 is agreed as per email decision made on Feb 26th.

[76-16] Bishwarup Mondal, NSN
Phase 2 calibration for 3D-channel model for email submission until 28th February
Done: Status to be checked during RAN1#76bis.

[76-17] Bishwarup Mondal, NSN
Baseline simulation for 3D-channel model for email submission until 28th February
Done: Status to be checked during RAN1#76bis.

Annex G: List of participants at RAN1 #76

Please see excel file attached to this report

Annex H: TSG RAN WG1 meetings in 2014 - 2015

TITLE	TYPE	DATES	LOCATION	CTRY
3GPPRAN1#76bis	WG	31 Mar – 04 Apr 2014	Shenzhen	China
3GPPRAN1#77	WG	19 – 23 May 2014	Seoul	KR
3GPPRAN1#78	WG	18 – 22 Aug 2014	Dresden	Germany
3GPPRAN1#78bis	WG	6 – 10 Oct 2014	Ljubljana	Slovenia
3GPPRAN1#79	WG	17 – 21 Nov 2014	San Francisco (TBC)	US
3GPPRAN1#80	WG	9 – 13 Feb 2015	TBD	EU
3GPPRAN1#80bis	WG	20 – 24 Apr 2015	TBD	EU
3GPPRAN1#81	WG	25 – 29 May 2015	TBD	TBD
3GPPRAN1#82	WG	24 – 28 Aug 2015	TBD	China
3GPPRAN1#82bis	WG	5 – 9 Oct 2015	TBD	TBD
3GPPRAN1#83	WG	16 – 20 Nov 2015	TBD	TBD

MEETING TYPES	
AH = Ad Hoc	CM = Chairmen's meeting
JM = Joint	OR = Ordinary
PM = Preparatory Meeting	RG = Rapporteurs Group
RM = Resolution Meeting	SG = Steering Group
ST = Startup Meeting	TG = Task Group
WG = Working Group	XO = Extraordinary

End of document

Appendix 30

www.3gpp.org / ftp / tsg_ran / WG1_RL1 / TSGR1_77 / Docs

sort by name/desc	sort by date/desc	sort by size/desc
R1-141900.zip	2014/04/21 17:56	28 KB
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R1-141924.zip	2014/05/10 6:27	33,9 KB
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R1-141927.zip	2014/05/10 6:27	71,4 KB
R1-141928.zip	2014/05/10 6:27	45,3 KB
R1-141929.zip	2014/05/10 6:27	70,8 KB

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sort by name/desc	sort by date/desc	sort by size/desc
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sort by name/desc	sort by date/desc	sort by size/desc
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R1-142149.zip	2014/05/10 6:26	290,6 KB
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R1-142151.zip	2014/05/10 6:26	31,9 KB
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sort by name/desc	sort by date/desc	sort by size/desc
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R1-142172.zip	2014/05/10 6:26	70,3 KB
R1-142173.zip	2014/05/10 6:26	82,6 KB
R1-142174.zip	2014/05/10 6:26	166,7 KB
R1-142175.zip	2014/05/10 6:26	47,8 KB
R1-142176.zip	2014/05/10 6:26	109,4 KB
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R1-142180.zip	2014/05/09 20:19	50,2 KB
R1-142181.zip	2014/05/09 20:19	34,5 KB
R1-142182.zip	2014/05/09 20:19	19,5 KB
R1-142183.zip	2014/05/09 20:19	57,7 KB
R1-142184.zip	2014/05/09 20:19	57,9 KB
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R1-142186.zip	2014/05/09 20:19	60,6 KB
R1-142187.zip	2014/05/09 20:19	97,7 KB
R1-142188.zip	2014/05/09 20:19	65,6 KB
R1-142189.zip	2014/05/09 20:19	30,3 KB
R1-142190.zip	2014/05/09 20:19	77,1 KB
R1-142191.zip	2014/05/09 20:19	90,5 KB
R1-142192.zip	2014/05/09 20:19	201,9 KB
R1-142193.zip	2014/05/09 20:19	92,1 KB
R1-142194.zip	2014/05/10 6:26	56,9 KB
R1-142195.zip	2014/05/10 6:26	82,2 KB
R1-142196.zip	2014/05/10 6:26	24,2 KB
R1-142197.zip	2014/05/10 6:26	23,9 KB
R1-142198.zip	2014/05/10 6:26	36,3 KB
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R1-142200.zip	2014/05/10 6:26	29,5 KB
R1-142201.zip	2014/05/10 6:26	35,3 KB

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R1-142215.zip	2014/05/10 11:59	46,4 KB
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R1-142219.zip	2014/05/10 6:26	201,9 KB
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R1-142225.zip	2014/05/09 20:19	138,5 KB
R1-142226.zip	2014/05/09 20:19	68,7 KB
R1-142227.zip	2014/05/10 6:26	67,9 KB
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R1-142236.zip	2014/05/10 6:26	254,4 KB

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R1-142265.zip	2014/05/10 6:25	101,6 KB
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R1-142270.zip	2014/05/10 6:25	107,9 KB

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R1-142277.zip	2014/05/10 6:25	44,8 KB
R1-142278.zip	2014/05/10 6:25	26,7 KB
R1-142279.zip	2014/05/10 6:25	82,1 KB
R1-142280.zip	2014/05/10 6:25	25,9 KB
R1-142281.zip	2014/05/10 6:25	23,9 KB
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R1-142291.zip	2014/05/10 6:25	138,6 KB
R1-142292.zip	2014/05/10 6:25	171 KB
R1-142293.zip	2014/05/10 6:25	170,3 KB
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R1-142297.zip	2014/05/10 6:25	216,7 KB
R1-142298.zip	2014/05/10 6:25	71 KB
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R1-142304.zip	2014/05/10 6:25	82,1 KB

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R1-142322.zip	2014/05/10 6:25	36,4 KB
R1-142323.zip	2014/05/10 6:25	124,1 KB
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R1-142337.zip	2014/05/10 6:25	168,4 KB
R1-142338.zip	2014/05/10 6:25	38,4 KB

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R1-142357.zip	2014/05/10 6:25	23,3 KB
R1-142358.zip	2014/05/10 6:25	62,8 KB
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R1-142367.zip	2014/05/10 11:59	21,4 KB
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R1-142369.zip	2014/05/10 6:25	25,6 KB
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R1-142371.zip	2014/05/10 6:25	19,1 KB
R1-142372.zip	2014/05/10 6:25	20,7 KB

sort by name/desc	sort by date/desc	sort by size/desc
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R1-142383.zip	2014/05/10 6:25	17 KB
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R1-142387.zip	2014/05/10 6:25	15 KB
R1-142388.zip	2014/05/10 6:25	17 KB
R1-142389.zip	2014/05/10 6:25	15,8 KB
R1-142390.zip	2014/05/10 6:25	106,1 KB
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R1-142406.zip	2014/05/09 20:18	17 KB

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R1-142425.zip	2014/05/09 20:18	41,7 KB
R1-142426.zip	2014/05/09 20:18	23,7 KB
R1-142427.zip	2014/05/09 20:18	26,9 KB
R1-142428.zip	2014/05/09 20:18	19,6 KB
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R1-142433.zip	2014/05/10 6:25	19,7 KB
R1-142434.zip	2014/05/10 6:25	26,8 KB
R1-142435.zip	2014/05/10 6:25	39 KB
R1-142436.zip	2014/05/10 6:25	44,1 KB
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R1-142438.zip	2014/05/09 20:18	30,7 KB
R1-142439.zip	2014/05/10 6:25	21,5 KB
R1-142440.zip	2014/05/10 6:25	97,5 KB

sort by name/desc	sort by date/desc	sort by size/desc
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sort by name/desc	sort by date/desc	sort by size/desc
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R1-142481.zip	2014/05/10 6:25	74,2 KB
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R1-142483.zip	2014/05/10 6:25	95 KB
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R1-142486.zip	2014/05/10 6:25	149,6 KB
R1-142487.zip	2014/05/10 6:25	62,1 KB
R1-142488.zip	2014/05/10 6:25	59,3 KB
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R1-142495.zip	2014/05/10 6:25	66,9 KB
R1-142496.zip	2014/05/10 6:25	8,4 KB
R1-142497.zip	2014/05/10 6:25	13,5 KB
R1-142498.zip	2014/05/10 6:25	11,1 KB
R1-142499.zip	2014/05/10 6:25	24,5 KB
R1-142500.zip	2014/05/10 6:25	61,8 KB
R1-142501.zip	2014/05/20 12:12	1523,4 KB
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R1-142503.zip	2014/05/10 6:46	35,4 KB
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sort by name/desc	sort by date/desc	sort by size/desc
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R1-142513.zip	2014/05/09 20:18	17,8 KB
R1-142514.zip	2014/05/09 20:18	86,1 KB
R1-142515.zip	2014/05/09 20:18	21 KB
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R1-142517.zip	2014/05/09 20:18	17,2 KB
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874 items.

Appendix 31

Source:	**MCC Support**
Title:	**Final Report of 3GPP TSG RAN WG1 #77 v1.1.0 (Seoul, South Korea, 19th – 23rd May 2014)**
Document for:	**Approval**



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Main facts summary

3GPP TSG WG RAN1 #77 meeting, hosted by LG Electronics was hold at the COEX InterContinental Seoul, South Korea.
The meeting started at 9:05 on Monday 19th May and finished at 17:10 on Friday 23rd May 2014.
The number of attending delegates, having signed the participants' paper list, was **277**.

The week was scheduled as follows:

- Monday: Common session on Agenda items 1, 2, 3, 4, 6.1&6.2 (E-UTRA maintenance Releases up to 12), AI 6.2.3.2.2 (Small Cell Enhancements - Performance Evaluation on Discovery signals) & AI 6.2.3.2.3 (Small Cell Enhancements – Discovery signals design), AI 6.2.4 (Physical layer functionalities required for operation of Dual Connectivity) and .D2D Synchronization signal (AI 6.2.5.3.2) followed by D2D eNB resource allocation (AI 6.2.5.2.2).

- Tuesday (LTE): Parallel sessions on
  - LTE D2D Proximity Services (AI 6.2.5) chaired by Satoshi Nagata on one hand.
  - Low Cost & Enhanced Coverage MTC UE for LTE (AI 6.2.2), Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation (AI 6.2.1) and Small Cell Enhancements (AI 6.2.3) chaired by Wanshi Chen on the other hand.
  - UE capabilities session during morning coffee break chaired by Kazuaki Takeda from NTT DOCOMO.
- Tuesday (HSPA): Scalable UMTS by Filtering (AI 5.6) chaired by Matthew Baker, followed by UMTS Heterogeneous Networks (AI 5.3) chaired by Carmela Cozzo from Huawei.

- Wednesday (LTE): Parallel sessions on
  - Physical layer functionalities required for operation of Dual Connectivity (AI 6.2.4), NAICS (AI 6.2.6) followed by Small Cell Enhancements (AI 6.2.3) chaired by Satoshi Nagata on one hand.
  - LTE D2D Proximity Services (AI 6.2.5) chaired by Matthew Baker on the other hand.
  - UE capabilities session during morning coffee break chaired by Kazuaki Takeda from NTT DOCOMO.
- Wednesday (HSPA): Further EUL Enhancements (AI 5.4) chaired by Karri Ranta-aho from NSN followed by Enhanced Broadcast of System Information (AI 5.5) chaired by Carmela Cozzo from Huawei.

- Thursday (LTE): Parallel sessions on
  - NAICS (AI 6.2.6), Small Cell Enhancements (AI 6.2.3) followed by Physical layer functionalities required for operation of Dual Connectivity (AI 6.2.4), chaired by Satoshi Nagata on one hand.
  - Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation (AI 6.2.1), Low Cost & Enhanced Coverage MTC UE for LTE (AI 6.2.2) chaired by Wanshi Chen followed by LTE Device to Device Proximity Services (AI 6.2.5) chaired by Matthew Baker, on the other hand.
- Thursday (HSPA): DCH Enhancements (AI 5.2) chaired by Karri Ranta-aho from NSN, followed by UMTS Heterogeneous Networks (AI 5.3) chaired by Carmela Cozzo from Huawei.

- Friday morning: Early session on eIMTA chaired by Zukang Shen from CATT. Low Cost & Enhanced Coverage MTC UE for LTE (AI 6.2.2) chaired by Wanshi Chen. Revision of AIs chaired by Satoshi Nagata.
- Friday afternoon: Revisions

The list of action points that required RAN1 close follow-up is listed in Annex F (end of document).

The number of contribution documents for this meeting was 871, and those documents were categorized as followed.

Agenda Item	Input Document	Discussed Document
AI 4 to 6.2.6	868	358

Note: The amount of documents includes those discussed during the email discussion session post meeting.

1 Opening of the meeting

Mr Satoshi Nagata (RAN1 Chairman) welcomed the participants of the RAN WG1 77th meeting and opened the meeting at 09:05.
Mr Byoung-hoon Kim from LGE welcomed the delegates on behalf of the host, LG Electronics and detailed the domestic arrangements for the full week.

Mr Chair warned the group about CCTV - China Central Television, one of the largest national broadcasting network in China - intent to make a documentary on 3GPP way of preparing the future of telecommunication, peculiar to what 4G mobile cellular systems can bring to enhance people life and provide better future. The movie will be produced by CCTV and PBS (Public Broadcasting System – an American broadcast television network) and broadcasted only in China.
Mr Chair asked the group whether any participating companies are having objections for the recording and promotion of 3GPP work and authorized CCTV to proceed for a limited records of the event.

1.1 Call for IPR

The Chairman drew the attention to Members' obligations under the 3GPP Partner Organizations' IPR policies. Every Individual Member organization is obliged to declare to the Partner Organization or Organizations of which it is a member any IPR owned by the Individual Member or any other organization which is or is likely to become essential to the work of 3GPP.

The attention of the members of this Technical Specification Group is drawn to the fact **that 3GPP Individual Members have the obligation** under the IPR Policies of their respective Organizational Partners to **inform their respective** Organizational Partners **of Essential IPRs they become aware of**.
The members take note that they are hereby invited:
- to investigate in their company whether their company does own IPRs which are, or are likely to become Essential in respect of the work of the Technical Specification Group.
- to notify the Director-General, or the Chairman of their **respective** Organizational Partners, of all potential IPRs that their company may own, by means of the IPR Statement and the Licensing declaration forms (e.g. see the ETSI IPR forms http://webapp.etsi.org/Ipr/).

1.2 Network usage conditions

The PCG has laid down the following network usage conditions:

Users shall not use the network to engage in illegal activities. This includes activities such as copyright violation, hacking, espionage or any other activity that may be prohibited by local laws.

Users shall not engage in non-work related activities that consume excessive bandwidth or cause significant degradation of the performance of the network.
Since the **network is a shared resource**, users should exercise some basic etiquette when using the 3GPP network at a meeting. It is understood that high bandwidth applications such as downloading large files or video streaming might be required for business purposes, but delegates should be strongly discouraged in performing these activities for personal use. Downloading a movie or doing something in an interactive environment for personal use essentially wastes bandwidth that others need to make the meeting effective. The meeting chairman should remind end users that the network is a shared resource; the more one user grabs, the less there is for another. Email and its attachments already take up significant bandwidth (certain email programs are not very bandwidth efficient). In case of need the chair can ask the delegates to restrict IT usage to things that are essential for the meeting itself.

1. DON'T place your WiFi device in ad-hoc mode
2. DON'T set up a personal hotspot in the meeting room
3. DO try 802.11a if your WiFi device supports it
4. DON'T manually allocate an IP address
5. DON'T be a bandwidth hog by streaming video, playing online games, or downloading huge files
6. DON'T use packet probing software which clogs the local network (e.g., packet sniffers or port scanners)

2 Approval of Agenda

R1-142241	Draft Agenda for RAN1#77 meeting	RAN1 Chairman	(R1-141900)

Satoshi Nagata (Chairman) proposed the agenda for the meeting, as well the schedule of the week.
Decision: The agenda is approved.

3 Approval of Minutes from previous meeting

R1-141901	Final Report of RAN1#76bis meeting	MCC	

The document was presented by Patrick Mérias (ETSI Mobile Competence Center) and provides the outcomes of last meeting in Shenzhen.
Discussion: MCC reminded that the official participants list is the MCC one (colored paper list) that remains at disposal at the back of the room during full week meeting.
Be more strict with the deadline on email discussion, particularly for the approval of CRs due to the deadline imposed by plenary - all should get agreed by Wednesday 4th June the latest.
Decision: The agenda is approved.

4 Incoming Liaison Statements

HSPA related

R1-141902	LS on RAN2 agreements and working assumptions on E-DCH decoupling	RAN2, NSN	= R2-141785

The document was presented by Karri Ranta-aho from NSN and requests RAN1 to take the presented agreements and working assumptions into account and advise if there are any concerns.
Discussion: No concerns.
Decision: The document is noted.

R1-141903	LS on DCH enhancements	RAN2, Qualcomm	= R2-141786

The document was presented by Arjun Bharadwaj from Qualcomm and informs that RAN2 common preference is to minimize impacts to L2 protocols and network entities, thus concatenation (in downlink) of Class A, B and C bits of the AMR vocoder should be done in the physical layer.
Decision: The document is noted.

R1-141904	LS on TTI switching indication from UE	RAN2, Ericsson	= R2-141787

The document was presented by … from Ericsson and informs that a working agreement was made in RAN2 that the UE will send the final TTI switch indication to Node B(s) via an 18bit MAC PDU.
Discussion: NSN made reference to contribution R1-142523 under AI 5.4.5 for discussion in Wed session.
Decision: The document is noted. RAN2 working agreement shall be considered under 5.4 discussion.

R1-141905	LS on TTI switching	RAN2, Ericsson	= R2-141789

The document was presented by … from Ericsson and asks RAN3 to take into consideration the need for the serving Node B to inform the RNC that the TTI switch is under way, and the need for the RNC to inform the non serving Node Bs so as to ensure synchronisation.
Discussion: No action to RAN1.
Decision: The document is noted.

D2D related

R1-141906	Reply LS on identifier in scheduling assignment for D2D communication	RAN2, Ericsson	= R2-141836

The document was presented by Iana Siomina from Ericsson and provides the following RAN2 agreements:

- In case of group- and uni-cast, L2 will convert the higher layer ProSe ID address identifying the destination (UE, Group) into two bit strings of which one can be forwarded to L1 and used as L1 ID whereas the other is used as L2 destination address.
- For broadcast L2 can indicate to L1 that it is a broadcast transmission. As baseline RAN2 assumes that this indication is a pre-defined L1 ID in the same format as for group- and unicast.
- RAN2 has no preference for the L1 ID size. RAN2 sees no problem providing an ID of a size as indicated in the RAN1 LS (e.g. 8 or 16).

Decision: The document is noted.

R1-142411	Draft LS reply on identifier in scheduling assignment for D2D communication	Ericsson	

The document was presented by Iana Siomina from Ericsson and asks RAN2 to clarify whether some L2 source address should be included in the Scheduling Assignments (SA) for ProSe Direct communication.
Discussion: Qualcomm → although not against the LS, additional discussion is needed.
Both ALU, Huawei commented that decision was made by RAN2 – no need to ask such clarification
LGE also in favor of additional discussion

Decision: The document is noted. No consensus so far, topic shall be discussed in the relevant D2D session. Continue offline discussion until Tuesday.
Tuesday 20th: Discuss offline until Thursday afternoon how to proceed in the light of the LS from RAN2 on the L1 ID.
Thursday 22nd:

R1-142659	Summary of Offline Discussion Regarding the LS from RAN2 on the L1 ID in the SA	Ericsson	

Decision: The document is noted.
Conclusion: no consensus on sending an LS reply to RAN2 regarding broadcast ID in the SA.
Decide at RAN1#78 whether to use directly the ID provided by higher layers or to modify it in some way at L1.

R1-141916	LS on parameter synchronization	SA3, Qualcomm	= S3-140566

The document was presented by Saurabha Tavildar from Qualcomm and informs that SA3 needs a counter value to supply freshness for the protection of discovery message. The counter would need the following properties.
The counter value is current UTC time based and is known to both announcing and monitoring such that each UE has the same value of counter. Also the counter value must be different for each discovery period and should wrap around over a long period of time, say one year.
Decision: The document is noted.

R1-142240	Reply LS on ProSe Lawful Interception	SA3-LI, US Department of Commerce	

The document was presented by Satoshi Nagata on behalf of USDoC and provides the answers to the question from RAN in LS RP-132107.
Discussion: No specific action to RAN1.
Decision: The document is noted.

R1-142580	LS on discovery message format for ProSe/D2D	SA3, Qualcomm	= S3-140995

The document was presented by Saurabha Tavildar from Qualcomm and provides the attached version of the ProSe security TS 33.303. In particular attention is drawn to clause 6.2.3 where SA3 is proposing to add security related fields to the PDCP header for one-to-many communications to enable ciphering of the data packet.
Discussion: No specific action to RAN1.
Huawei commented that SA2/SA3 views should be taken into account in the design.
Decision: The document is noted.

R1-142581	Reply LS on Provisioning of ProSe configuration information in a public safety ProSe enabled UE	SA3, Qualcomm	= S3-140996

The document was presented by Saurabha Tavildar from Qualcomm and states SA3 view that provisioning the ME with one or more parameters present on USIMs and have the ME check if the parameter(s) of the selected USIM matches those stored in the ME may be an appropriate solution. SA3 also believe that CT6 is appropriate group to decide on such parameters.
Decision: The document is noted.

Dual connectivity

R1-141907	LS on prioritizing MCG uplink transmission	RAN2, Samsung	= R2-141848

The document was presented by Aris Papasakellariou from Samsung and provides the following RAN2 working assumptions:

- The MCG serving cells carry SRBs and are therefore essential for maintaining the connection towards the UE.
- The preamble transmission in the PCell is considered more important than preamble transmission in any other cell.

Decision: The document is noted. RAN2 working agreement shall be considered under the relevant session on dual connectivity.

R1-141908	LS on SFN handling in the dual connectivity	RAN2, Samsung	= R2-141849

The document was presented by Aris Papasakellariou from Samsung and deals with the handling of the SeNB SFN upon UE acquisition of SI for the SCG, and e.g. in order to align DRX occasions or measurement gaps between MCG and SCG.
Discussion: No action to RAN1.
Decision: The document is noted.

R1-141909	LS on Activation/deactivation for Dual Connectivity	RAN2, NSN	= R2-141851

The document was presented by Jari Lindholm from NSN and informs RAN4 of the following agreements:

- MeNB can only activate and deactivate Cells associated with MeNB. SeNB can only activate and deactivate Cells associated with SeNB. Cross-eNB activation/deactivation is not supported.
- Special SCell (i.e. the cell with PUCCH from SeNB) starts with activated state upon configuration and cannot be deactivated.

- Other SCells from SeNB/MeNB starts with deactivated state upon configuration and can be activated/deactivated same as Rel-10/11.

Discussion: No action to RAN1.
Decision: The document is noted.

Micelleanous

R1-141910	Reply LS on subframe #6 in LTE_TDD_eIMTA	RAN2, CATT	= R2-141852

The document was presented by Xueming Pan from CATT and informs that RAN1 agreements in the LS R1-141025 are acceptable but may require certain network restrictions/behaviour.
Decision: The document is noted.

R1-141911	Reply LS on Identification of TBS/bandwidth limited UE by eNB	RAN3, Huawei	= R3-140947

The document was presented by Ms Yuan Xia from Huawei and states that in order for an eNB to know whether a UE is TBS/bandwidth limited or not for paging, some updates in the S1 interface are necessary.
Decision: The document is noted. To be discussed in Low cost MTC session.

R1-141912	Reply LS on GCSE QCIs and connected mode DRX	RAN3, Samsung	= R3-140950

The document was presented by Aris Papasakellariou from Samsung and states that:

- QCI values available in the interfaces under the scope of RAN3 are in the range of integers from 0 to 255. There is no protocol impact even if one or more new QCIs are added in TS 23.203 as long as their values are in the range.
- Push to Talk signaling should have higher priority than Push to Talk voice, since the Push to Talk signaling is needed prior to Push to Talk media delivery.
- Two companies think that the characteristics of the proposed new service are not adequately represented by QCI alone, and would prefer having an additional indicator associated with the new QCI value.

Discussion: No action to RAN1.
Decision: The document is noted.

R1-141913	Reply LS on consolidated operator view on eCoMP standardization	RAN3, Samsung	= R3-140951

The document was presented by Aris Papasakellariou from Samsung and informs NGMN that discussion in RAN3 is depending on RAN1's guidance for the signaling parameters to be exchanged over X2 interface as per RAN Plenary decision.
Discussion: No action to RAN1.
Decision: The document is noted.

R1-141914	LS on maxumum relative propagation delay difference among the component carriers in intra-band non-contiguous CA	RAN4, NTT DoCoMo	= R4-142358

The document was presented by Fred Takeda from NTT DOCOMO and informs RAN2 of the following agreement:

- Maximum relative propagation delay difference among the component carriers which UE should cope with is 30.26 us in Intra-band Non-contiguous CA.

Discussion: No action to RAN1.
CATT → RAN4 should also look into this Intra-band Non-contiguous CA with multiple timing advance issue.
Decision: The document is noted.

R1-142582	LS on introducing the EVS codec in MTSI	SA4, Panasonic	= S4-140750

The document was presented by Hidetoshi Suzuki from Panasonic and raises the following:

- SA4 asks for any feedback on the supported bitrate operations of the EVS codec, pointing out that for rates up to 24.4 kbit/s the bitrates of the EVS codec were defined including the RTP payload header size in order to fit Transport Blocks that were earlier defined for AMR/AMR-WB. Note that the rates above 24.4 kbit/s are net source coding bitrates that are not optimized for specific Transport Blocks.
- Depending on session setup, bitrate adaptation may be possible among bitrates of EVS in a session. SA4 asks for RAN1's view on the possible impact of bitrate adaptation on system efficiency.

Discussion: If no comments/questions, no need to reply during the week.
Decision: The document is noted.

RSRQ measurements definition

R1-141915	LS on defining the new RSRQ measurements definition	RAN4, Nokia	= R4-142526

The document was presented by Klaus Hugl from Nokia and informs about RAN4 conclusion that network should configure the UE whether the UE measures the RSRQ with RSSI only in CRS symbols or the RSRQ with RSSI in all OFDM symbols in a sub-frame.
Proposed sentence:
If higher-layer indicates that the RSSI is measured in all OFDM symbols for performing RSRQ measurements then the UE shall measure the RSSI over all OFDM symbols in a measured subframe.
Discussion: Corresponding CRs follow…
Decision: The document is noted.

R1-142430	Draft 36.214 CR on additional RSRQ measurement definition	Nokia, NSN	

The document was presented by Klaus Hugl from Nokia and introduces a new E-UTRA RSRQ measurement behavior with RSSI measured in all OFDM symbols in any measured subframe as requested by RAN4 in R1-141915 (R4-142526).
Discussion: Sentence rephrazed as follows:
If higher-layer signalling indicates that the RSSI is to be measured in all OFDM symbols for performing RSRQ measurements, then the RSSI is measured over all OFDM symbols in any measured subframe.
CR category issue? Should be C
Decision: The document is noted.

R1-142431	Draft 25.215 CR on additional RSRQ measurement definition	Nokia, NSN	

The document was presented by Klaus Hugl from Nokia and covers the same issue as R1-142430 but for UMTS FDD.
Decision: The document is noted.

R1-141979	25.225 CR0103 (Rel-12, C) New E-UTRA RSRQ measurements definition	CATT	

The document was presented by Yanping Xing from CATT and covers the same issue as R1-142430 but for UMTS TDD.
Discussion: CATT used the RAN4 sentence – will need further check to align with Nokia proposal
Decision: The document is noted. Continue offline discussion until Friday – Nokia
Friday 23rd

R1-142739	36.214 CR0021 (Rel-12, C) New E-UTRA RSRQ measurement definition	Nokia, NSN, CATT	(R1-142430)
R1-142740	25.215 CR0200 (Rel-12, C) New E-UTRA RSRQ measurement definition	Nokia, NSN, CATT	(R1-142431)
R1-142741	25.225 CR0103r1 (Rel-12, C) New E-UTRA RSRQ measurement definition	CATT, Nokia, NSN	(R1-141979)

The documents were not explicitly presented as Nokia indicated that feedback from different companies expressed over email reflector is to post-pone the CR approval until RAN2 agreed on some related signaling solution.
Decision: The document is noted. Continue discussion in RAN1#78 meeting.

4.1 Incoming LS received during the meeting

Not treated. These incoming LSs will be postponed until RAN1#78.

R1-142627	Reply LS on ProSe Lawful Interception	SA5, Qualcomm	= S5-143384
R1-142693	LS on Introducing the ProSe Authorized IE	RAN3, Ericsson	= R3-141444
R1-142697	LS on response SFN handling issue in dual connectivity	RAN4, Huawei	= R4-143843
R1-142736	Reply LS on SFN handling in the dual connectivity	RAN3, NSN	= R3-141479

R1-142684	LS on NAICS Parameters	RAN4, Qualcomm	= R4-143847

Treated under AI 6.2.6

5 UTRA

R1-142710	Chairpersons' summary of the UMTS sessions	UMTS Session Chairpersons (NSN, Huawei, Alcatel-Lucent)	

The document was presented by the relevant chairs and provides the outcomes of the UMTS sessions.
Decision: The document is endorsed and incorporated below.

5.1 Maintenance of UTRA Releases 4 – 11

5.1.1 FDD

R1-142458	25.214 CR0716 (Rel-11, F) Clarifications to Multiflow Operation	Qualcomm Incorporated	R1-142603

Decision: The document is noted. Come back after offline discussions to improve the wording. Revision 1 of the CR in R1-142603 is for email review until May 28th, Qualcomm.

R1-142513	25.214 CR0717 (Rel-11, F) Compressed mode in Multiflow assisting (secondary) serving cell	NSN	R1-142604

Decision: The document is noted. Come back after offline discussions to improve the wording. Revision 1 of the CR in R1-142604 is for email review until May 29th, NSN.

R1-142545	Discussion on DRX operation for Multiflow	Huawei, HiSilicon	

Decision: The document is noted.

R1-142546	25.214 CR0718 (Rel-11, F) Correction of DRX operation for Multiflow	Huawei, HiSilicon	

Decision: The document is noted and the CR is for email review until May 29th, Huawei. Consider also introducing definitions of T_txdiff1 and T_txdiff2 in TS25.211.

R1-142547	25.214 CR0719 (Rel-11, F) Clarification of the power scaling for MIMO dual transport block transmission	Huawei, HiSilicon	

Decision: The document is noted.
Conclusion: CR in principle agreed with the revision to make the content of CR change as follows:

- After calculating the reduced E-DPDCH and S-E-DPDCH gain factors, quantization according to table 1B.2B in [3] subclause 4.2.1.3 may be applied, where each $\beta_{ed,k,reduced}$ is quantized such that $\beta_{ed,k}/\beta_c$ is the largest quantized value for which the condition $\beta_{ed,k} \leq \beta_{ed,k,reduced}$ holds, and $\beta_{sed,k,reduced}$ is set to the same value as the quantized $\beta_{ed,k,reduced}$.

Revision 1 of CR0719 is agreed in R1-142706.

5.1.2 TDD

None.

5.2 DCH Enhancements

WID in RP-131357. The enhancements are intended to target AMR voice over DCH, and/or SRB over DCH (where applicable.)

R1-142459	Summary of email discussions in RAN1#76bis on DCH enhancements	Qualcomm Incorporated	

Decision: The document is noted.
Conclusion:
The outcome of the email discussion is endorsed with the following points still subject to discussion:

- In option 2b the following fix should be made (from 10 ms to 20 ms): "*if UE is commanded or has decided to switch to 20 ms TTI, the UE UL DPDCH shall follow the transmission method in CM as stated above for the case when UE enters CM while in 20ms transmission mode in NM*"
- Compressed mode operation in basic capability set is subject to further discussion

Prepare an update of the summary in R1-142707.

R1-142707	Agreements based on email discussions after RAN1#76bis on DCH enhancements	Qualcomm	

Decision: The document is noted and agreed.

5.2.1 *Remaining aspects*

R1-142514	Hamming distance analysis of Uplink TFCI code variants	NSN	

Decision: The document is noted.

R1-142305	UL TFCI Discussion	MediaTek Inc.	

Decision: The document is noted.

R1-142548	Coding for Uplink TFCI	Huawei, HiSilicon	

Decision: The document is noted.

Agreements:

- For 10/20 ms transmission indication use
  - Use contiguous space of the code
    - The TFCIs 0,...,#TFC-1 indicate TFCs with 20 ms
    - The TFCIs #TFC,...,2*TFC-1 indicate TFCs with 10 ms
- Code for TFCI & 10/20 ms transmission indication
  - Use truncated sub-code of (32,10)
  - Use basis sequences 0,...,19 of the 32,10 code to truncate the transmitted codeword to 20 bits

- The maximum number of TFCs is 32, hence 2*32 TFCIs are needed to indicate all TFCs with 10/20 ms

R1-142572	Remaining aspects of DCH enhancements	Qualcomm Incorporated	(R1-142460)

Decision: The document is noted.

- Proposal: Higher layers signal the list of transport channel numbers, corresponding to transport channels carrying AMR Class A, B, C bits, to be concatenated and jointly encoded at layer 1.
- Proposal: Power boosting on DL DPDCH is applied when SRB is transmitted. The boosting level is configured with parameter PO_{SRB}. The valid range of PO_{SRB} shall be 0..6, in steps of 0.25dB.
- Proposal: The minimum TTI value for UL transport channels with enhanced DCH is 20ms.
- Proposal: The switch between 10 ms and 20 ms transmission mode can only take place at max TTI boundaries, i.e. with DCCH using 40 ms TTI in the RAB combination the transmission duration switch can only take place at 40 ms boundary.
- Proposal: If E-DCH or HS-DSCH are configured and CPC is not configured together with DCH Enhancements, then only the 20ms transmission mode is allowed, and no DTX is allowed for DL DPCCH and UL DPCCH.
- Proposal: The slot pairs for transmitting FET-ACK are fixed (10,11), (12,13),…,(28,29). UE may enter DTX as soon as at least two consecutive slots (i.e. not including slots falling in compressed mode transmission gap) of ACK are sent.

R1-142307	Uplink ACK Transmission in Compressed Mode	MediaTek Inc.	

Decision: The document is noted.

R1-142306	Remaining Design Details of DL 10ms Mode Transmission	MediaTek Inc.	

Decision: The document is noted.

R1-142573	Basic UE Capability Mode of Operation	Qualcomm Incorporated	(R1-142463)

Decision: The document is noted.

Agreements:

- When the UL is in 10ms transmission mode, the DL BLER target is 1% at the end of slot 14, the end of the first 10ms radio frame.
- When the UL is in 20ms transmission mode, the DL BLER target is 1% at the end of slot 29, at the end of 20ms duration.
- UE applies a 3-dB reduction to its ILPC SIR target set-point when switching from 10ms to 20ms transmission mode
- UE applies a 3-dB increase to its ILPC SIR target set-point when switching from 20ms-tansmission mode to 10ms-transmission mode.

R1-142461	DL Compressed mode operation without SF reduction	Qualcomm Incorporated	

Decision: The document is noted.

R1-142462	UL FET operation for DCH enhancements	Qualcomm Incorporated	

Decision: The document is noted.

Email discussion on remaining issues until 21st June, Peyman, Qualcomm

Send LS of RAN1 agreements to other RAN groups.

R1-142708	LS on RAN1 Decisions for Enhanced DCH Work Item	RAN1, Qualcomm	

The document was presented by Peyman Razaghi from Qualcomm.
Decision: The document is noted and agreed.

Not treated.

R1-142567	UL FET design considerations	Qualcomm Incorporated	
R1-142568	Ack channel design for UL FET	Qualcomm Incorporated	

5.2.2 CR review

R1-142464	25.211 CR0316 (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	

Decision: The document is noted. Email discussion until RAN1#78 on TS25.211 CR, Qualcomm

R1-142600	25.212 CR0329R1 (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	(R1-142465)

Decision: The document is noted. Email discussion until RAN1#78 on TS25.212 CR, Qualcomm

R1-142466	25.214 CR0715 (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	

Decision: The document is noted. Email discussion until RAN1#78 on TS25.214 CR, Qualcomm

Not treated. Email discussion until RAN1#78 on TS25.300 CR, Qualcomm

R1-142467	25.300 CR Introduction of DCH Enhancements	Qualcomm Incorporated	

5.3 UMTS Heterogeneous Networks Enhancements

WID in RP-140463.

5.3.1 Reliability of HS-DPCCH and other uplink channels

R1-142034	Considerations on introducing a second pilot for HetNet SHO	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

- Observation 1: Having the E-DPCCH offset power relative to the power of the 2ndary pilot would lead to unnecessary power consumption at the UE and interference at the LPN.
- Observation 2: Happy Bit that is currently carried by the E-DPCCH does not need to be updated frequently.
- Proposal 1: The Happy Bit is carried by a new Happy Channel (HCH), (or alternatively in the CQI field of the HS-DPCCH), as well as on the E-DPCCH.
- Proposal 2: Use the virtual pilot scheme as the 2ndary pilot.

Decision: The document is noted.

R1-142414	On Control Channel Robustness for Secondary Pilot and ILPC Restriction Schemes	Ericsson	

- Proposal 1: For the secondary pilot scheme, it shall be possible to set E-DPCCH relative the secondary pilot in order to guarantee reliable reception of scheduling information in the serving cell.
- Proposal 2: Discuss and agree on a solution for ensuring reliable TPC loops. This is equally relevant for both the ILPC restriction and secondary pilot approaches.
- Proposal 3: If secondary pilot is not included in Rel-12, consider if specification changes are required to enable ILPC restriction operation with good performance.

Decision: The document is noted.

R1-142468	Link Simulation Results for Secondary Pilot	Qualcomm Incorporated	

- Proposal: Secondary pilot is adopted as the solution for UL/DL imbalances in Rel-12

Decision: The document is noted.

R1-142549	Evaluation of HS-DPCCH solutions	Huawei, HiSilicon	

- Observation 1: For the secondary pilot solution Option 1 the required E-DPCCH C/P varies for different imbalance values. The update of E-DPCCH C/P needs to be done by RRC signaling and this implies a certain delay.
- Observation 2: The baseline solution and the secondary pilot solution Option 2 perform slightly better than secondary pilot solution Option 1, and the secondary pilot solution Option 2 performs similar to the baseline solution.
- Observation 3: It is not clear how secondary pilot solution Option 2 would work in boosting scenario.

Decision: The document is noted.

Conclusion on HS-DPCCH reliability solution

Agreements:

- Secondary pilot (DPCCH2) is introduced as solution for HS-DPCCH reliability. The network is allowed not to configure the secondary pilot (it is optional for the network to use the secondary pilot).
- E-DPCCH power is relative to DPCCH.
- Increase the range of power offset beta_ec/beta_c. Table 1B in 25.213 should be extend up to 151/15.
- Slot format for DPCCH2 (8,2). TPC bits on DPCCH2 carry the DL power control commands for F-DPCH transmitted from the serving HS-DSCH cell. TPC bits on DPCCH carry the DL power control commands for F-DPCH transmitted from the non-serving HS-DSCH cell.
- DPCCH2 is turned ON/OFF by RRC.
- DPCCH power control is not affected.

Open issues. Come back on Wednesday:

- Channelization code
- Maximum power scaling for DPCCH2: DPCCH2 is always power scaled with HS-DPCCH.

- Uplink synchronization criterion to be checked. Possibly reuse DPCCH2 instead of DPCCH.
- Consider transmitting DPCCH2 only when HS-DPCCH is transmitted (the behaviour will be the same as CPC today)
- F-DPCH2 transmission. The serving DSCH cell transmits uplink TPC commands for DPCCH2.

Wednesday 21st

Agreements:

- Uplink synchronization: 25.214 Section 4.3.1.3 – add DPCCH2
- F-DPCH2 transmission. The serving DSCH cell transmits uplink TPC commands for DPCCH2. Two F-DPCH non-colliding resources are used.

Email discussion on remaining details of secondary pilot solution, until May 29th , Huawei

The following is conditionally agreed to the email discussion

- Channelization code [41] (The reference document for the channelization code performance is R1-112172 – note that the simulations in R1-112172 were used to select the code number for S-DPCCH at RAN1#66, and now those same simulations are proposed to be used for selecting the code number for HS-DPCCH)
- Maximum power scaling for DPCCH2: DPCCH2 is always power scaled with HS-DPCCH
- Should the non-serving cell be aware of the presence of DPCCH2?
- DPCCH2 is only transmitted when HS-DPCCH is transmitted (the behaviour will be the same as the existing CPC)

R1-142550	Considerations on dynamic rate and power adjustment solution	Huawei, HiSilicon	

Decision: The document is noted.

5.3.2 Mitigating interference from not SHO UEs

R1-142551	Further considerations on extended E-HICH solution	Huawei, HiSilicon	

- Observation 1: Introducing extended E-HICH in the strong imbalance zone with RSCP differences from 6dB to 9dB provides significant uplink gains.
- Observation 2: The uplink gain increases when the UE moves closer to the LPN.
- Observation 3: Loosening the MDR requirement to 15%, extended E-HICH still introduces 1.6~2dB uplink gain for UEs in the strong imbalance zone with RSCP from 6dB to 9dB.
- Proposal 1: Introduce extended E-HICH feature in strong imbalance zone.
- Proposal 2: Adopt alternative 1 or 2 to introduce the extended E-HICH feature in the strong imbalance zone.

Decision: The document is noted.

Agreement: Introduce the possibility of transmitting E-HICH from the non-serving E-DCH without transmitting F-DPCH.

R1-142469	Common RGCH for Mitigating Interference for Ues not in Soft Handover	Qualcomm Incorporated	

- Proposal: Common RGCH operation in Cell_DCH is adopted as an interference mitigating technique in Hetnets.

Decision: The document is noted.

Agreement: Introduce common RGCH.

Prepare a draft LS to RAN2/RAN3 about the introduction of transmitting E-HICH from the non-serving E-DCH without F-DPCH and/or common RGCH. Add details about these features. Consider attaching contribution R1-141671. R1-142613 - (Huawei)

R1-142613	LS on interference management techniques in Hetnet	RAN1, Huawei	

Decision: The document is noted and the LS is agreed.

5.3.3 Remaining aspects

R1-142470	Signaling for CIO Adaptation	Qualcomm Incorporated	

- Proposal 1: Maximum Supported CIO is signalled by the UE to aid the network in configuring appropriate UE specific CIO values
- Proposal 2: Send an LS to RAN4 asking them to define minimum requirements in a Hetnet scenario for the maximum supported CIO.

Decision: The document is noted.

R1-142552	Further discussion on offloading and CIO adaptation in Hetnet	Huawei, HiSilicon	

- Proposal: Consider the long term CQI measurement and offloading mechanism in Rel-12, and send LS to RAN2.

Decision: The document is noted.

R1-142035	CIO configuration in HetNet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

- Proposal 1: UEs can be configured with CIO values based on their receiver capabilities.
- Proposal 2: Send an LS to RAN2 on introducing the use of max CIO including the following:
  - Indicate to the UE to use its 'supported max CIO' in its measurements and event triggers
  - The network further indicates to a UE that it can use its 'supported max CIO' value up to a signalled value of a network determined threshold CIO value
  - The UE reports the maxCIO value used for the measurement evaluation in the triggered measurement report.
- Proposal 3: Send an LS to RAN4 to specify a test case to ensure that control channels are reliable when the UE is operating at the max CIO.

Decision: The document is noted.

Not treated.

R1-142319	[DRAFT] LS on UE receiver capability based CIO configuration in UMTS HetNet	Alcatel-Lucent	

Conclusion on CIO adaptation
It is RAN1 opinion that feedback from the UE to help offloading decision at the network is useful, but the specific nature of the feedback has not been established.

5.3.4 CR review

Not treated.

R1-142515	25.212 Draft CR (Rel-12, B) Introduction of target HS-SCCH override order in enhanced Serving Cell Change based on Event 1C	NSN	

R1-142619	25.211 Draft CR (Rel-12, B) Introduction of UMTS Heterogeneous Networks Enhancements	Huawei, HiSilicon	(R1-142554)

Decision: The document is noted. Email discussion until June 23rd on TS25.211 CR, Huawei.

R1-142620	25.212 Draft CR (Rel-12, B) Introduction of UMTS Heterogeneous Networks enhancements in 25.212	Huawei, HiSilicon	

Decision: The document is noted. Email discussion until June 23rd on TS25.212 CR, Huawei.

R1-142621	25.213 Draft CR (Rel-12, B) Introduction of UMTS Heterogeneous Networks Enhancements	Huawei, HiSilicon	(R1-142556)

Decision: The document is noted. Email discussion until June 23rd on TS25.213 CR, Huawei.

R1-142622	25.214 Draft CR (Rel-12, B) Introduction of UMTS Heterogeneous Networks Enhancements	Huawei, HiSilicon	(R1-142557)

Decision: The document is noted. Email discussion until June 23rd on TS25.214 CR, Huawei.

5.3.5 Other

R1-142516	[draft] RAN1 response to LS on RAN2 agreements and working assumptions on E-DCH decoupling	NSN	

Decision: The document is noted.

R1-142553	Response to LS on E-DCH decoupling	Huawei, HiSilicon	

Decision: The document is noted.

Agreement
UL CLTD or UL MIMO and E-DCH decoupling can be configured together without sending HS-SCCH order from the serving E-DCH cell. It is RAN1 view that there is no need to change the specifications to disable sending the orders from the serving HS-DSCH cell.

Update R1-142516 in R1-142614. Come back on Wednesday. (NSN)

Wednesday 21st

R1-142614	RAN1 response to LS on RAN2 agreements and working assumptions on E-DCH decoupling	RAN1, NSN	

Decision: The document is noted and the LS is agreed.

Not treated.

R1-142517	HS-SCCH override order for event 1C	NSN	

Proposal: Allow the network to select the cell from the AS for an event 1C based eSCC

R1-142618	LS on Progress in RAN1 #77 for the UMTS Heterogeneous Networks Enhancements WI	RAN1, Huawei	

Decision: The document is noted and the LS is agreed.

5.4 Further EUL Enhancements

WID in RP-140127.

5.4.1 DTX/DRX enhancements including improved power control

R1-142415	System Level Simulations on Improving the Power Control after DTX on Secondary Carriers	Ericsson	

- Proposal 1: Consider the gains observed in the System Level Evaluations for improving the power control after DTX on secondary carriers.
- Proposal 2: Incorporating the averaging filter algorithm described in [R1-142416] for improving the initial power after a DTX gap.

Decision: The document is noted.

R1-142416	Link Level Simulations on Improving the Power Control after DTX on Secondary Carriers	Ericsson	

- Proposal 1: The parameter Thresh_gap_length shall be introduced. Thresh_gap_length can be configurable and set by higher layers over RRC. When a transmission gap is less than Thresh_gap_length, legacy power control is used. When a transmission gap is equal to or greater than Thresh_gap_length, the initial DPCCH power of the secondary carrier is set according to equation (1) and (2).
- Proposal 2: The parameter, α, depicted in equation (2), shall be introduced. α can be configurable and set by higher layers over RRC.
- Proposal 3: The parameter UE_Sec_Tx_Power_Offset, depicted in equation (1), shall be introduced. UE_Sec_Tx_Power_Offset can be configurable and set by higher layers over RRC, and it can also be signalled by HS orders.

Decision: The document is noted.

R1-142471	Power Control Enhancements for TDM Operation with DTX	Qualcomm Incorporated	

- Observation: Single TTI scheduling is significantly worse than scheduling users for multiple TTIs. It is unclear when a stable operation can be achieved for 1TTI scheduling policies. It is recommended that 4 or more TTIs are allocated per user for each scheduling opportunity.
- Proposal: Use legacy rules for setting the initial power on the secondary carrier after a long DTX cycle.

Decision: The document is noted.

R1-142518	Simulation results for Power Control for Long DTX Cycle	NSN	

Decision: The document is noted.

Not treated.

R1-142558	Considerations on improved power control for TDM operation	Huawei, HiSilicon	

Proposal 1: Reusing the latest UL DPCCH power for the initial power setting at least for the case that the transmission gap is not long.
Proposal 2: Dynamic step size for DPCCH power control during the preamble phase after a long transmission gap is considered.
Proposal 3: TBS compensation for the first E-DCH TTIs after a long transmission gap is considered.

Agreement on power setting after a long DTX gap

- For setting the secondary carrier power after a DTX gap:
  - Use alpha-filtered primary carrier power + offset
    - The alpha and the offset are parameters configured by the RNC using RRC signalling
  - If the actual transmission gap on DPCCH on the secondary carrier is shorter than a threshold, the last used power on the secondary carrier is used instead
    - The gap length threshold is configured by the RNC using RRC signalling

R1-142559	Further considerations on transmitting DL control channels for the secondary carrier on the primary carrier	Huawei, HiSilicon	

- Proposal 1: Transmitting downlink control channels including F-DPCH, E-AGCH, E-RGCH and E-HICH for the secondary carrier on the primary carrier.

Decision: The document is noted.

Working assumption:

- Allow for transmitting the F-DPCH, E-AGCH, E-RGCH and E-HICH related to the secondary uplink carrier on the primary downlink carrier.
- The benefit related to the power control gains should be shown in RAN1#78, and if found convincing by the group the working assumption is converted to agreement.

R1-142560	Removal of synchronization procedure when the secondary carrier is activated	Huawei, HiSilicon	

- Proposal 1: Synchronization procedure is removed when the secondary uplink carrier is activated.

Decision: The document is noted.

Agreement: The synchronization procedure A is not applied for the secondary carrier when the secondary uplink carrier is activated.

5.4.2 Improved granting

HARQ for TDM operation

R1-142472	HARQ Mechanism for TDM Operation	Qualcomm Incorporated	

- Proposal 1: A UE with a Rel-12 TDM-grant delays a HARQ re-transmission by 8 TTIs if it does not have a grant at the time of the re-transmission. This action is repeated until the UE has a grant, at which point the re-transmission is made.
- Proposal 2: UE supporting Rel-12 TDM granting scheme shall monitor E-AGCH with two E-RNTIs, applying legacy rules to grants received on one of them and the new Rel-12 rules to grants received on the other one.
- Proposal 3: When the UE does not have any data to transmit, SI=0 is transmitted and the grant is implicitly released.
- Proposal 4: When the UE goes into DRX, an SI=0 is transmitted and the UE releases its grant.
- Proposal 5: The grant scope bit for a TDM grant shall always be interpreted as indicating that the grant is valid for all HARQ processes.

Decision: The document is noted.

R1-142522	Update on HARQ solutions for TDM operation	NSN	

- Proposal 1: The network can configure UEs to either follow the legacy HARQ operation (prioritize retransmissions) or the proposed solutions.
- Proposal 2: A UE can be configured not to perform retransmissions automatically if the Serving Grant is set to Zero or Inactive but to hold a packet in the buffer until it receives a Serving Grant again. Additionally, the UE can be configured to inform the network about a retransmission need by sending Scheduling Information if it is in the Soft Handover.
- Proposal 3: When UE is configured not to perform retransmissions automatically the UE still increases the retransmission number as if the retransmission took place. When the retransmission number reaches MAX HARQ the UE drops the packet and it is up to the higher layers to perform the retransmission.

Decision: The document is noted.

R1-142562	Retransmission for improved granting for TDM operation	Huawei, HiSilicon	

- Proposal 1: Adopt the E-HICH based solution to handle the retransmission issue for the TDM scheduling. In this solution:
- The UE monitors both E-AGCH and E-HICH simultaneously. When the UE decodes E-AGCH successfully:
  - If the UE receives NACK in the E-HICH and the UE has not transmitted anything in the associated HARQ process, then the UE will not start data transmission in the corresponding HARQ process;
  - If the UE receives ACK in the E-HICH, then the UE will start data transmission in the corresponding HARQ process

Decision: The document is noted.

Agreements on HARQ handling in TDM operation

- The UE does not send E-DCH retransmissions when the UE does not have a grant.
- Retransmissions are sent following the same synchronous HARQ retransmission process after the UE is given a valid grant, unless the HARQ buffer was flushed due to Retransmission Sequence Number of the packet having reached the maximum number of retransmissions

- The Retransmission Sequence Number is incremented also on those re-transmission instances that do not get transmitted.

Grant detection

From R1-142472
Proposal 2: UE supporting Rel-12 TDM granting scheme shall monitor E-AGCH with two E-RNTIs, applying legacy rules to grants received on one of them and the new Rel-12 rules to grants received on the other one.

R1-142519	TDM Operation for multiple simultaneous transmissions	NSN	

- Proposal: In TDM operation use the grant scope bit (or alternatively grant identity) to distinguish between two types of grants allowing for many simultaneous uplink transmissions.

Decision: The document is noted.

R1-142561	Support of multi-user scheduling based on grant detection solution	Huawei, HiSilicon	

- Proposal: Continue UL transmission when the UE previously granted by a grant detection E-AGCH simultaneously receives an E-RGCH carrying positive command and a grant detection E-AGCH intended for other UE, to support multiple UE scheduling for grant detection solution.

Decision: The document is noted.

Agreements on multi-user scheduling with grant detection

- UE operating with Rel-12 TDM granting scheme uses the scope bit on E-AGCH to decide whether to apply legacy rules or Rel-12 grant detection rules for the grant received.
- The grant scope is always considered to be 'for all HARQ processes' regardless of which way the Scope Bit on E-AGCH is set..

R1-142520	Grant Detection and DL DRX	NSN	

- **Proposal:** Discuss and decide on one of the two solutions to be adopted for grant detection and UE DRX.

Decision: The document is noted.

Agreements on grant detection and DL DRX

- When the UE runs out of data to transmit SI=0 is transmitted and the grant is implicitly released.

5.4.3 HS-DPCCH overhead reduction

R1-142563	Remaining details for HS-DPCCH overhead reduction	Huawei, HiSilicon	

- Proposal 1: Introduce an additional CQI feedback cycle k_1 with a range of [0, 2, 4, 8, 10, 20, 40, 80, 160, 16, 32, 64] ms, where k_1 should be an integer multiple of k and k <= k_1 or k_1 = 0.
- Proposal 2: Introduce a parameter indicating the initial value of CQI report cycle timer configured by higher layers, with the range of [0, 1, 2, 4, 8, 16, 32, 64, 128, 256, 512].
- Proposal 3: Introduce an HS-SCCH order to switch to the short CQI feedback cycle, and the HS-SCCH order type is $x_{eodt,1}$, $x_{eodt,2}$, $x_{odt,1}$, $x_{odt,2}$, $x_{odt,3}$, $x_{ord,1}$, $x_{ord,2}$, $x_{ord,3}$ = 01011101.
- Proposal 4: The default CQI cycle is CQI feedback Cycle k_1.

Decision: The document is noted.

Agreement:

- Additional CQI feedback cycle values: [0, 8, 10, 20, 40, 80, 160, 16, 32, 64] ms
  - Additional CQI feedback cycle value shall be an integer multiple of the CQI feedback cycle 'k'
  - The signaling could also be provided as the integer multiple to CQI feedback cycle 'k', e.g. with multiplier values [0, 4, 8, 10, 20]
  - Value '0' should mean CQI is never sent in either type of signalling
- The inactivity timer values triggering : [4, 8, 16, 32, 64, 128, 256, 512, infinity] TTIs
- The initially used feedback cycle is the Rel-5-defined CQI feedback cycle 'k'

The values in square brackets in the set of agreements above are recommendation only, and for RAN2 and RAN3 to consider when introducing the feature to the specifications.

Prepare an LS to RAN2/3 on the agreements on HS-DPCCH overhead reduction in R1-142616, Huawei
The LS is for email review until Thursday 29th of May.

5.4.4 CR review

R1-142417	25.212 CR0327 (Rel-12, B) Introduction of Further EUL Enhancements	Ericsson	

Decision: The document is noted.
Conclusion: The CR in R1-142417 is technically endorsed for the E-DCH TTI switching order part. If other features discussed in the work item have 25.212 impacts, those will be added on top of this CR.

R1-142418	25.214 CR0713 (Rel-12, B) Introduction of Further EUL Enhancements	Ericsson	

Decision: The document is noted.
Email review until June 21th, concerns/improvement suggestions should be provided by June 14th. Discussion to be limited to the features currently in CR0713, Ericsson.

Email discussion on introduction of agreements of RAN1#77 to the physical layer specifications until RAN1#78. Ericsson.

Not treated.

R1-142521	Specification Impact for Grant Detection TDM operation	NSN	

5.4.5 Other

R1-142523	UL TTI switch indication from the UE	NSN	

- Observation 1: The ACK on HS-DPCCH is a proven mechanism for indicating successful reception of HS-SCCH orders for the serving Node B.
- Observation 2: The MAC PDU message as the final TTI switch indication is not suitable for notifying non-serving Node Bs.
- Observation 3: No over-the-air final TTI switch indication messages are needed when the network signaling based indication is in place.
- In this paper concerns on the need and feasibility of using a MAC PDU as a final TTI switch indication towards non-serving Node Bs has been raised.
- We further suggest notifying RAN2 of the findings and recommending RAN2 to base the notification towards non-serving Node Bs on the already agreed network-based signalling via RNC.

Decision: The document is noted.

Conclusion: provide RAN2 with an LS indicating that

- Using MAC PDU indication towards non-serving Node Bs has reliability issues
- RAN1 would recommend using E-DPCCH indication over MAC PDU indication, if synchronous procedure is desired
- If asynchronous switch, in which the non-serving Node Bs are informed over Iub is chosen, the impact is loss of macro diversity in the uplink for the duration of incorrect TTI configuration in the non-serving Node Bs.

R1-142615	Response LS on TTI switching indication	Qualcomm	

Decision: The document is noted and final LS is agreed in R1-142709.
Post meeting: MCC noticed that the LS is addressed to RAN2 & RAN3, but the action sentence reads "RAN1 respectfully asks RAN2, RAN3 and RAN4 to take the information in this LS into account when specifying TTI Switching." → typo issue.

LS to RAN2/3 on the agreements for FEUL, Ericsson

R1-142617	LS on Further EUL Enhancements	RAN1, Ericsson	

Decision: The document is noted and agreed.

5.5 *Enhanced Broadcast of System Information*

WID in RP-140131.

5.5.1 Remaining aspects

None

5.5.2 CR review

R1-142419	25.211 CR0315 (Rel-12, B) Introduction of Enhanced Broadcast of System Information	Ericsson	
R1-142420	25.212 CR0328 (Rel-12, B) Introduction of Enhanced Broadcast of System Information	Ericsson	

R1-142421	25.213 CR0117 (Rel-12, B) Introduction of Enhanced Broadcast of System Information	Ericsson	
R1-142422	25.214 CR0714 (Rel-12, B) Introduction of Enhanced Broadcast of System Information	Ericsson	

The CRs are for email review until June 21th, concerns/improvement suggestions should be provided by June 14th. Ericsson.

5.6 Study on Scalable Bandwidth UMTS by Filtering

SID in RP-132122.

5.6.1 Evaluation for standalone scenario

R1-142502	TP on uplink performance for F-UMTS	China Unicom, Huawei	

Decision: The document is noted.
Conclusion: No consensus on this TP due to different simulation assumptions; no current interest to progress uplink evaluations further.

R1-142424	Text Proposal on Uplink Signal Characteristics for Scalable UMTS	Ericsson	

Decision: The document is noted.
Conclusion: TP is agreed for inclusion in the TR. Open issue on UL PAPR evaluation is completed from RAN1 perspective, but it is noted that further study would be needed in RAN4.

R1-142524	TP to TR25.701 on PRACH handling	NSN	R1-142605

Decision: The document is noted.
Conclusion: TP is agreed for inclusion in the TR, with change of S-UMTS -> Scalable UMTS and addition of a note that further analysis of preamble detection in the presence of other preambles and impact on Enhanced Cell_FACH could be carried out.
Revise accordingly in R1-142605.

R1-142608	TP to TR25.701 on PRACH handling	NSN	(R1-142605)

Decision: The document is noted. Revise again in R1-142610 as follows: These results indicate PRACH performance in the presence of AWGN interference. The performance in the presence of other preambles has not been studied.

R1-142610	TP to TR25.701 on PRACH handling	NSN	(R1-142608)

Decision: The document is noted and is agreed for inclusion in TR.

R1-142525	TP to TR25.701 on AICH and PICH processing	NSN	

Decision: The document is noted and is agreed for inclusion in TR.

5.6.2 Evaluation for multi-carrier scenario

R1-142564	TP on cross carrier scheduling for CZ-UMTS carrier aggregation	Huawei, HiSilicon	

Decision: The document is noted and agreed for inclusion in the TR, with addition of text mentioning:

- that this is one example solution for supporting signalling for cross-carrier scheduling, and other solutions may be considered.
  - this solution would not allow MIMO to be supported on either the primary or secondary carriers if that were desired; other solutions which may allow MIMO to be supported are not discussed here.
  - the impact of using the same HARQ process on the primary and secondary carriers has not been studied.
  - this solution does not support the use of the scalable carrier for multi-carrier operation for some users and standalone for others, if that were desired;
- [Insert in the conclusions as a separate paragraph immediately before "The operation of SCH with chip zeroing was shown to be feasible…"] Assuming that standalone operation is not supported and there is therefore only one uplink available, the impact on uplink performance of signalling to support multi-carrier operation, and lack of ability to balance between uplink carriers, has not been studied. – to be introduced directly in next update of TR.

Revise accordingly in R1-142606.

R1-142606	TP on cross carrier scheduling for CZ-UMTS carrier aggregation	Huawei, HiSilicon	(R1-142564)

Decision: The document is noted and is agreed for inclusion in TR.

5.6.3 Other

R1-142570	On RRC filter for S-UMTS	NSN	(R1-142527)

Decision: The document is noted for information.

R1-142423	On the Support of UMTS Features by Scalable UMTS	Ericsson	

Decision: The document is noted.
Conclusion: capture the following in the TR:
Initial observations have been made, that the following aspects have not been considered in any detail by RAN1:

- The degree to which scalable UMTS and UMTS features should be tied
- How capability signaling should be managed, considering signaling and test overhead
- Impacts on the overall benefit of scalable UMTS and carrier management of not supporting all UMTS features
- Specification complexity and management

R1-142609	Text proposal on the impact of supporting UMTS Features by Scalable UMTS	Ericsson	

Decision: The document is noted and agreed for inclusion in TR in R1-142611 with the following deletions:
~~, and, for example low gains for scalable UMTS could be a reason for omitting a feature from UMTS~~
~~, which would be likely to cause significant complexity in the specifications~~

R1-142503	TP on conclusions of filtered Scalable UMTS	China Unicom, Huawei	

Decision: The document is noted. No consensus on first changed paragraph.
Modify second changed paragraph as follows:

> It is considered that the operation of PRACH with and without chip zeroing is possible. ~~Since the p~~Performance of PRACH with and without chip zeroing is comparable to that of UMTS in AWGN conditions; preamble detection in the presence of other preambles, and impact on Enhanced Cell_FACH in case of chip-zeroing, have not been studied. ~~, and~~It is noted that the number of PRACH signatures for PRACH without chip zeroing ~~is~~would be the same as normal UMTS while scaled down to 1/N for PRACH with chip zeroing~~, it is preferred to adopt PRACH without chip zeroing. However, a detailed study of PRACH performance has not been carried out, thus PRACH performance is not concluded.~~ The impact of filtering and chip zeroing on PAPR and CM in the uplink has not been concluded

Modify third changed paragraph as follows:

> The benefits of cross carrier scheduling includes: increasing the available power in the secondary cell and helps to balance the control channel overhead, potential for reducing the total number of HS-SCCH monitored by UE, and ~~enhancing the~~giving a UE battery life saving compared to the degraded UE battery life of multi-carrier operation.

No consensus on the last change.
Prepare a revised version accordingly in R1-142607.

R1-142607	TP on conclusions of filtered Scalable UMTS	China Unicom, Huawei	(R1-142503)

Decision: The document is noted and is agreed for inclusion in TR.

Consolidated CR for TR capturing all the agreed TPs: R1-142612 – revisit for approval on Friday.
Friday 23rd

R1-142612	25.701 CR008 (Rel-12, B) Update of the TR based on agreements done on RAN1#77 meeting	NSN	

The document was presented by Karri Ranta-aho from NSN.
Decision: The document is noted and CR is agreed.

5.7 Other

R1-142565	Introduction of enhancement to uplink power control algorithm 2 to reduce power consumption of DL TPC commands	Huawei, HiSilicon	

Decision: The document is noted.
Not treated.

R1-142566	25.214 Draft CR (Rel-12, B) Introduction of enhancement to uplink power control algorithm 2 to reduce power consumption of DL TPC commands	Huawei, HiSilicon	

6 E-UTRA

6.1 Maintenance of E-UTRA Releases 8 – 11

36.212 related

R1-142178	Draft CR on CQI feedback format table in TS 36.212	Panasonic	

The document was presented by Michael Einhaus from Panasonic and suggests correcting “Subband second PMI i2” to “Wideband second PMI i2” in Table 5.2.2.6.2-2A and in Table 5.2.2.6.2-2B.
Decision: The document is noted. CR is agreed in principle and will be included by 36.212 editor in Rel-12 CR.

36.213 related

R1-141948	Draft 36.213 CR Clarification on SRS colliding with PUCCH in the same cell under mTAG	Qualcomm Inc., Fujitsu	

The document was presented by Wanshi Chen from Qualcomm and clarifies the intended UE behavior when SRS collides with PUCCH in the same cell when the UE is configured with multiple TAGs.
Discussion: Supported by Huawei.
Correct WI code should be LTE-Phys
Decision: The document is noted. Final CR are agreed as CR0460 in R1-142585 (Rel-11) and as CR0461 in R1-142586 (Rel-12), assuming WI code is corrected.

R1-141972	On SRS antenna switching	Qualcomm Inc.	

The document was presented by Wanshi Chen from Qualcomm and recommends that RAN1 discuss and conclude the common understanding, when the UE is configured with open-loop UE transmit antenna selection:

- Alt 1: the UE is mandated to follow the same SRS antenna switching specified for the closed-loop UE transmit antenna selection case
- Alt 2: the UE implements SRS antenna selection without any restriction
  - Including the same SRS antenna switching mechanism specified for the closed-loop UE transmit antenna case or any other possible implementations

Decision: The document is noted. Offline discussion till Friday.
Friday 23rd

R1-142726	36.213 CR0462 (Rel-12, F) Clarification on SRS antenna switching	Qualcomm	

Decision: The document is noted and is for email approval until 29th May – Qualcomm.

R1-142179	Reconfiguration behaviour	Panasonic	

The document was presented by Hidetoshi Suzuki from Panasonic and proposes to confirm following understanding.

- UE behaviour is unspecified around RRC reconfiguration even up to release 12 similar to release 8.
- Whether UE behave correctly around RRC reconfiguration is up to UE manufacture including DCI format 1A.

Discussion: Intel has concern and would like to understand the meaning of above statements.
Decision: The document is noted.

R1-142325	Discussion on reference resource for TM 10	Huawei, HiSilicon, Panasonic, Samsung	

The document was presented by Daniel Mazzarese from Huawei and clarifies that for TM10 without PMI/RI configured, the PDSCH signals would have a ratio of EPRE to CSI-RS EPRE equal to the ratio given in section 7.2.5, i.e. the ratio of PDSCH EPRE to CSI-RS EPRE is given by P_c.
Proposal: discuss how to capture the clarification with one of the 3 options below:

- Option A: add the following sentence for TM10 without PMI/RI configured:
  - "The corresponding PDSCH signals would have a ratio of EPRE to CSI-RS EPRE equal to the ratio given in section 7.2.5".
- Option B: delete the sentences highlighted in green in the appendix.
- Option C: no change to the specification

Discussion:
Huawei asked whether the following proposal
Clarify that for TM10 without PMI/RI configured, the PDSCH signals would have a ratio of EPRE to CSI-RS EPRE equal to the ratio given in section 7.2.5, i.e. the ratio of PDSCH EPRE to CSI-RS EPRE is given by P_c.
could be taken as common understanding
Decision: The document is noted.

R1-142326	Correction on reference resource for TM 10	Huawei, HiSilicon	

Decision: The document is noted. Continue offline discussion until Friday – (Huawei)
Friday 23rd

R1-142742	Summary of offline discussion on EPRE assumption for CSI derivation in TM10 without PMI/RI configured	Huawei, HiSilicon	

The document was presented by David Mazzarese from Huawei.
Discussion: No need for a CR assuming the following common understanding.
Decision: The document is noted.

- RAN1 common understanding is that for CSI derivation in TM10 without PMI/RI configured, the PDSCH signals would have a ratio of EPRE to CSI-RS EPRE equal to the ratio given in section 7.2.5, i.e. the ratio of PDSCH EPRE to CSI-RS

EPRE is given by Pc.

6.2 LTE Release 12

TDD-FDD CA

R1-142128	Summary of discussion on number of DL HARQ processes	LG Electronics	

The document was presented by Joon Kui Ahn from LGE and suggests:

- Maximum number of DL HARQ processes may be defined separately for each UL/DL configuration of TDD serving cell in case of TDD PCell.
- If we are to define maximum number of DL HARQ processes separately for each UL/DL configuration of TDD serving cell in case of TDD PCell, select between option 1a-1 and option 1a-*2*.

Discussion:

- (Option 1a-1) define number of DL HARQ processes for each TDD serving cell's UL/DL configuration, assuming 8ms RTT. Supported by LGE, CATT, ITRI, ITL, DOCOMO.
- (Option 1a-2) define number of DL HARQ processes for each TDD serving cell's UL/DL configuration, assuming 10ms RTT. Supported by Ericsson, CATT.
- (Option 1b) define number of DL HARQ processes as 8 regardless whether the serving cell is FDD or TDD without further optimization. Supported by Samsung, Qualcomm, Intel, DOCOMO, Microsoft, MotM, Nokia.
- (Option 1c) define number of DL HARQ processes as the smaller of Table 7-1 in 36.213 or 8 for TDD Scell without further optimization. Supported by Huawei, HiSilicon.

Decision: The document is noted.

R1-141980	Discussion on the number of DL HARQ processes for TDD SCell with FDD PCell	CATT	

The document was presented by Ms Ying Peng from CATT and proposes that the number of DL HARQ processes on TDD SCell is defined as 4, 6, 7, 7, 8, 8, 5 for UL-DL configuration 0-6 assuming 8ms RTT.

Decision: The document is noted.

Agreement: Option 1b

Define M_{DL_HARQ} as 8 regardless whether the serving cell is FDD or TDD without further optimization) for FDD Pcell.

Above agreement will be reflected by 36.213 editor in Rel-12 CR.

R1-142082	Periodic CSI reporting for TDD-FDD CA	Samsung	

The document was presented by Seunghoon Choi from Samsung and proposes the following for periodic CSI reporting in TDD-FDD CA:

- For TDD-FDD CA, the configurable set of CQI/PMI reporting period N_{pd} (in subframes) of Scell should be clarified. Discuss Alt.1 (N_{pd} of Pcell) and Alt. 2 (common N_{pd} value of Pcell and Scell) to finalize the periodic CSI reporting for TDD-FDD CA.

Decision: The document is noted. Offline discussion needed. Revisit on Friday.

Friday 23rd

R1-142747	Offline discussion on CQI/PMI reporting period for TDD/FDD CA	Samsung	

The document was presented by Seunghoon Choi from Samsung.

Discussion: CATT → the conclusion "Alt. 1 for TDD PCell." doesn't cope with the text already captured in CR36.213

Decision: The document is noted. Possible conclusion is to agree the following update:

Updated Alt. 1) Periodicity values (Npd) from Pcell apply to Scell in case PUCCH on Pcell only for TDD-FDD CA

Email approval until 29th May just focusing on TDD-FDD CA– (Samsung).

R1-142083	SRS transmission for TDD-FDD CA	Samsung	

The document was presented by Seunghoon Park from Samsung and concludes that a UE configured with two-symbol SRS in UpPTS may not transmit the SRS (trigger type 0) when PUSCH transmission overlaps in the same symbols if Rel-10/11 CA procedure is applied.

Proposal 1: It is proposed to discuss the possible alternatives as below and to specify corresponding UE behaviour when two-symbol SRS and PUSCH transmissions overlap in TDD-FDD CA.

Alt. 1: Transmit entire PUSCH and drop two-symbol SRS in UpPTS

Alt. 2: Transmit entire PUSCH and transmit two-symbol SRS in UpPTS. (when the UE is power limited, drop two-symbol SRS.)

Alt. 3: Rate match PUSCH around the last SC-FDMA symbol and transmit the second SRS in UpPTS (drop the first SRS only)

Proposal 2: It is proposed to discuss and specify corresponding UE behaviour when two-symbol SRS and PUCCH transmissions (HARQ-ACK and/or positive SR) overlap in TDD-FDD CA. For example,

- If a UE is configured with ackNackSRS-SimultaneousTransmission = FALSE, the UE transmits HARQ-ACK and/or positive SR using normal PUCCH format and does not transmit SRS.
- Otherwise (ackNackSRS-SimultaneousTransmission = TRUE), the UE transmits HARQ-ACK and/or positive SR using shortened PUCCH format and transmits the second SRS.

Discussion: CATT → need to be aligned with former agreement on number of DL HARQ processes
Decision: The document is noted. Offline discussion needed. Revisit on Friday.
Friday 23rd

R1-142746	Offline discussion on SRS transmission for TDD/FDD CA	Samsung	

The document was presented by Seunghoon Choi from Samsung.
Decision: The document is noted.
Email approval until 29th May – (Samsung).

DL subframe for TDD

R1-142539	36.211 CR0190 (Rel-12, F) Clarification of downlink subframes	Ericsson	

The document was presented by Daniel Larsson from Ericsson and suggests adding DwPTS to relevant places in the text.
Decision: The document is noted.

R1-142330	Draft CR on clarification of DL subframes	Huawei, HiSilicon	

The document was presented by Brian Classon from Huawei and suggests changing "downlink subframes" or "DL subframes" to "subframes" at relevant places in the text.
Decision: The document is noted and is agreed in principle for both 36.211 and 36.212. Editorial checking is required. Revisit on Friday. Continue checking this change to other CRs.
Friday 23rd

R1-142724	36.211 CR0190R1 (Rel-12, F) Clarification of downlink subframes	Ericsson	(R1-142539)
R1-142765	36.212 CR0159 (Rel-12, F) Clarification of downlink subframes	Huawei, HiSilicon	

Decision: Both CRs are agreed.

Rel-12 CRs

R1-142538	36.211 Draft CR (Rel-12, B) Inclusion of eIMTA, TDD-FDD CA, and coverage enhancements	Ericsson	

Decision: The document is noted.

R1-142329	Editor's document for the 36.212 specification for rel-12	Huawei	

The document was presented by Brian Classon from Huawei and lists of open issues for eIMTA and TDD-FDD CA identified by the editor.
Decision: The document is noted.

R1-142328	36.212 DraftCR (Rel-12, B) Introduction of Rel 12 features of TDD-FDD CA and eIMTA	Huawei	

Decision: The document is noted.

R1-142501	36.213 Draft CR for Introduction of Rel-12 LTE-Advanced features in 36.213	Motorola Mobility	

Decision: The document is noted.

Mr Chair: Any feedback on the above CRs are welcome and should be provided to editors before Wed 21st.

Not treated.

R1-142081	DL HARQ process for TDD SCell in TDD-FDD CA	Samsung	
R1-142242	Maximum number of DL HARQ processes for TDD serving cell with FDD Pcell	ITRI	
R1-142331	Maximum number of DL HARQ processes for TDD SCell with FDD PCell	Huawei, HiSilicon	

R1-142528	Discussion on the number of DL HARQ processes for TDD serving cell with FDD Pcell	ITL Inc.	

Friday 23rd

R1-142763	36.212 DraftCR (Rel-12, B) Introduction of Rel 12 features of TDD-FDD CA and eIMTA	Huawei	(R1-142328)

Decision: The document is noted.
CATT→ concern with Low Cost MTC and potential impact to RAN4 spec → may not be a good idea for inclusion in the Rel-12 CRs.

R1-142764	Draft rel-11 CR for Clarification on determination on soft buffer size	Huawei	

Decision: The document is noted and agreed as CR0160 in R1-142766.

Email approval until 26th May for all Rel-12 CRs (211, 212, 213)
Editors will provide updated Rel-12 CRs until 26th May reflecting RAN1 #77 meeting agreements
Editors will provide updated Rel-12 CRs by reflecting low cost MTC and 256QAM in small cell enhancement by 8th August, then all delegates should check and comment to editors until RAN1 #78 meeting

Rel-12 UE capabilities

R1-142327	Discussion on Rel-12 UE capabilities	Huawei, HiSilicon	

The document was presented by Weimin Xiao from Huawei.
Decision: The document is noted.

R1-142504	Discussion on Rel-12 UE capabilities	CMCC	

The document was presented by Xiaodong Shen from CMCC.
Decision: The document is noted.

Not treated.

R1-142273	Further views on Rel-12 UE capabilities	NTT DOCOMO	

Friday 23rd

R1-142759	Update on RAN1 Excel sheet on LTE Rel-12 UE Capablities	NTT DOCOMO	

Decision: The document is noted and is for email approval until 5th June – (NTT DOCOMO).

Email discussion about eIMTA capability until 5th June – (CATT).

6.2.1 Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation

WID in RP-121772.
Open issues are listed in SR RP-140192

R1-142719	Summary of Ad-hoc session on Further Enhancements to LTE TDD for DL-UL Interference Management and Traffic Adaptation	Ad-Hoc Chairman (Qualcomm)	

The document was presented by Wanshi Chen from Qualcomm and provides the outcomes of eIMTA session.
Discussion: CATT noticed a couple of copy/paste errors in working assumption
Decision: The document is endorsed and incorporated below with corrections.

6.2.1.1 Remaining details on CSI feedback

R1-141949	CSI measurement and reporting in eIMTA	Qualcomm Inc.	

Decision: The document is noted.
Continue offline discussion, revisit on Thursday.

Not treated

R1-141981	Remaining details on aperiodic CSI feedback for eIMTA	CATT	
R1-141982	Remaining details on periodic CSI feedback for eIMTA	CATT	
R1-142084	Remaining Issues for CSI Reporting	Samsung	
R1-142129	Remaining Details on CSI Feedback for TDD eIMTA	LG Electronics	
R1-142194	CSI reference resource for A-CSI reporting for eIMTA	Sharp	

R1-142195	Remaining issues on periodic CSI reporting during fallback for eIMTA	Sharp	
R1-142221	Remaining details on CSI feedback for TDD eIMTA	ZTE	
R1-142332	Discussion on remaining details for CSI feedback	Huawei, HiSilicon	
R1-142534	Remaining issues on CSI feedback for eIMTA	Ericsson	

6.2.1.2 Remaining HARQ details

R1-141947	Discussion on remaining details for HARQ-ACK transmission	Huawei, HiSilicon	

Decision: The document is noted.

R1-142086	HARQ-ACK feedback procedures for eIMTA	Samsung	

Decision: The document is noted.

R1-142130	Remaining Details on HARQ-ACK Feedback for TDD eIMTA	LG Electronics	

Decision: The document is noted.

R1-142625	Way forward on the usage of UL DAI or UL index in DCI format 0/4	Huawei, HiSilicon, Panasonic, NEC	

Decision: The document is noted.

Agreement:

- The UL index is used in DCI format 0/4, when UL-DL configuration 0 is configured as UL reference configuration
- For one configured serving cell, the ordering of HARQ-ACK bits for PUCCH format 1b with channel selection is determined according to the new DL association set tables specified for PUCCH resource management

Not treated.

R1-141950	HARQ-ACK feedback for eIMTA	Qualcomm Inc.	
R1-141983	Remaining details on HARQ-ACK on PUSCH	CATT	
R1-141984	Remaining details on HARQ-ACK on PUCCH	CATT	
R1-142023	Remaining details on HARQ-ACK and CSI feedback for support of eIMTA	Intel Corporation	
R1-142085	HARQ-ACK Transmission in PUSCH	Samsung	
R1-142164	Remaining issues for HARQ-ACK feedback on PUSCH	NEC	
R1-142180	UL Index and DAI bits in DCI format 0/4	Panasonic	(R1-141210)
R1-142196	HARQ-ACK reporting on PUCCH for eIMTA	Sharp	
R1-142197	DL HARQ-ACK in TDD-FDD CA with eIMTA	Sharp	
R1-142432	HARQ-ACK bits ordering for PUCCH format 1b with channel selection	NSN, Nokia	
R1-142433	Usage of UL DAI and UL Index with UL reference configuration #0	NSN, Nokia	
R1-142533	On dynamic interpretation of UL index and UL DAI	Ericsson	

6.2.1.3 Other

R1-142087	UL Power Control – Remaining Issues	Samsung	

Decision: The document is noted.

Proposal:

- If the UE transitions from one UL power control set to two UL power control sets, the initialization of $f_{c,2}(0)$ is given by
  - Alt 1: $f_{c,2}(0) = f_c(i)$ where $f_c(i)$ is the closed-loop component of the conventional UL PC process in subframe i
  - Alt 2: $f_{c,2}(0) = 0$

R1-142131	Remaining Issues for TDD eIMTA	LG Electronics	

Decision: The document is noted.

Agreement:

- For DL subframes not part of the set of DL/special subframes indicated by SIB1, the value of m_i is assumed as 0 when computing the number of PHICH groups
- How to capture it into the spec is up to spec editor

Discuss offline on CA related aspects

Thursday 22nd

R1-142700	Summary of eIMTA offline discussion	CATT	

Decision: The document is noted.

Agreements:

- Regarding PUCCH format 1a/1b resource allocation for DL-reference configuration 5, the PUCCH format 1a/1b resource allocation is given according to R1-141064.
- In case of PUCCH format 1a/1b with channel selection and two configured serving cells, HARQ-ACK bit ordering is the same as in Rel-11, and the PUCCH format 1a/1b resource is determined according to R1-141064.
- The value range for the parameters of the second uplink power control subframe set is the same as that of the first uplink power control subframe set.
- If the UE transitions from one UL power control set to two UL power control sets and the value of $P_{\text{O\_UE\_PUSCH},c}$ for the first subframe set is changed, the initialization of $f_{c,2}(0)$ is given by
  - $f_{c,2}(0) = 0$
- If the UE is configured with two UL power control sets, the f_c or $f_{c,2}$ value is reset to 0 only for the subframe set for which the value of $P_{\text{O\_UE\_PUSCH},c}$ is changed.
- If the UE transitions from one UL power control set to two UL power control sets and the value of $P_{\text{O\_UE\_PUSCH},c}$ for the first subframe set is not changed, the initialization of $f_{c,2}(0)$ is given by $f_{c,2}(0) = 0$
- If Pcell is not configured with eIMTA and if all eIMTA secondary serving cell(s) configured for a UE are deactivated, the UE is not required to monitor the reconfiguration DCI
- For a UE not capable of simultaneous Rx/Tx and configured with eIMTA, the UE follows the Rel-11 behavior, except that the UL-DL configuration of a radio frame follows the L1 UL-DL configuration if the UE detects a valid L1 reconfiguration DCI for the radio frame.

~~Working assumption (to be automatically confirmed by Friday if no further comments)~~

Friday 23rd :

Agreements:

- For a UE configured with eIMTA and two Rel-12 CSI subframe sets for aperiodic CSI report on an uplink subframe n,
  - if there is no valid reference resource between A-CSI triggering subframe and subframe n-4, the DL reference resource for the A-CSI is a DL subframe prior to the triggering subframe, where the DL subframe is:
    - a valid DL subframe, and
    - corresponds to the triggered CSI subframe set, and
    - the lowest indexed DL subframe for TM9 or the lowest indexed non-MBSFN DL subframe for TM 1-8 (according to the L1 indicated UL/DL configuration) in radio frame m, and
    - the radio frame m is the latest radio frame containing at least one valid DL subframe for TM9 or ~~the lowest indexed~~ one valid non-MBSFN DL subframe for TM 1-8 (according to the L1 indicated UL/DL configuration) for the triggered CSI subframe set
  - Otherwise, the latest valid DL subframe (according to the L1 indicated UL/DL configuration) before subframe n-4 and corresponding to the triggered CSI subframe set is the DL reference resource for the A-CSI.

Agreements:

- For aperiodic CSI for TM 10, the reference resource for a triggered CSI subframe set is the latest valid DL subframe no later than subframe n – 4 and corresponding to the triggered CSI subframe set
- Confirm the working assumption (regarding CSI-IM configuration) with revision:
  - If the Rel-12 two CSI subframe sets for TDD is configured for a UE, the restriction is removed for all downlink subframes

Confirm the following working assumption with revision:

- In Rel-12, no change to the definition of a CSI-IM resource compared to Rel-11
- One CSI process can be configured with 2 CSI-IM resources only if the CSI process is also configured with 2 Rel-12 CSI subframe sets

- If one CSI process is configured with 2 CSI-IM resources and with 2 Rel-12 CSI subframe sets, no RAN1 specification change in terms of the association between subframe sets and CSI-IM resources
- A UE can be configured with up to 4 Rel-11 CSI-IMs for a serving cell.
- If a UE is configured with 4 Rel-11 CSI-IM resources, the UE can be configured with multiple CSI processes using all 4 Rel-11 CSI-IMs only if the UE is configured with eIMTA and at least one of the CSI processes is configured with two CSI-IM resources.
- ~~If a UE is configured with more than one CSI process, at most 2 CSI processes can be configured with 2 CSI-IM resources each, only if each of the two CSI processes is also configured with 2 Rel-12 CSI subframe sets~~
- Rel-12 CSI subframe sets are common to all CSI processes for a serving cell

For Periodic CSI, confirm the following working assumptions with revisions:

- For UEs configured with eIMTA, for periodic CSI report in subframe n, the corresponding CSI reference resource is determined by the existing definition for TM 1 – 10 (in TS36.213 section 7.2.3), with the following additions:
  - If the eIMTA UE receives a valid UL-DL configuration for a radio frame via a reconfiguration DCI, the DL and special subframes according to the indicated UL-DL configuration in the radio frame can be valid CSI reference resources
  - If the eIMTA UE does not receive a valid UL-DL configuration for a radio frame via a reconfiguration DCI, the DL and special subframes according to the SIB-1 UL-DL configuration in the radio frame can be valid CSI reference resources
- Further discussion (at CR stage) on UE behavior (which needs to be defined) if a UE does not receive the L1 indicated UL/DL configuration for a radio frame.

Not treated.

R1-141951	Remaining issues for eIMTA	Qualcomm Inc.	
R1-141985	Other remaining issues for TDD eIMTA	CATT	
R1-142198	Details on monitoring subframes for reconfiguration DCI in TDD CA and eIMTA	Sharp	
R1-142222	UE capabilities for TDD eIMTA	ZTE	
R1-142288	Remaining Details of UL/DL Reconfiguration for eIMTA	HTC	

6.2.2 Low Cost & Enhanced Coverage MTC UE for LTE

WID in RP-140522

R1-142734	Summary of Ad-hoc session on Low Cost & Enhanced Coverage MTC UE for LTE	Ad-Hoc Chairman (Qualcomm)	(R1-142720)

The document was presented by Wanshi Chen from Qualcomm and provides the outcomes of Low Cost MTC session.
Decision: The document is endorsed and incorporated below.

6.2.2.1 Remaining details of new UE category/type

Conclusion from RAN1#76bis:

- FFS until RAN1 #77 focusing on at least the following issues:
  - Whether or not there is any need/benefits to change PDCCH search space and DCI sizes
  - Impact, if any, on ACK/NAK resource allocation
  - Whether or not Cat. 0 UEs can be served by eNBs without knowledge of Cat. 0 UEs, and if so, any issues
  - Whether or not simultaneous unicast and broadcast is allowed (depending on whether or not there is a decision in RAN2 or not)
  - Transmission mode(s) supported by Cat. 0 UEs
  - Whether or not EPDCCH is supported
  - Whether or not SPS is supported
  - Issues, if any, on coverage for TDD with Cat. 0 UEs
  - Details of Category 0 to be incorporated into 36.306

R1-141944	The remaining open issues for low cost MTC UEs	Huawei, HiSilicon	

Decision: The document is noted.

R1-141952	Remaining details of UE category type	Qualcomm Inc.	

Decision: The document is noted.

R1-142024	Remaining issues for low cost MTC UE	Intel Corporation	

Decision: The document is noted.

R1-142036	Details on Low Cost MTC UE	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted.

R1-142166	Impact analysis of eNB not knowing a Category 0 UE with 1 RX antenna	NEC	

Decision: The document is noted.

R1-142435	Benefits of Knowing about Cat-0 UE during RAR/Paging	NSN, Nokia	

Decision: The document is noted.

Agreements:

- For Cat 0 UEs, there is no change of control channel search space and DCI sizes relative to Cat 1 UEs
- For Cat 0 UEs, SPS is supported
- For Cat 0 UEs, ACK/NAK resource management is the same as that of Cat 1 UEs
- For Cat 0 UEs, the number of soft buffer bits for unicast is 25344

Proposal:

- For Cat 0 UEs, simultaneous unicast and broadcast is allowed as in Cat 1 UEs
    - FFS discussion on the max number of bits that a Cat 0 UE can receive in one subframe for SI/P/RA-RNTI based DL transmissions
- Question: has RAN2 already decided that it's up to UE implementation on how to handle parallel unicast and broadcast transmissions?

Further discussion until Thurday:

- Whether or not Cat. 0 UEs can be served by eNBs without knowledge of Cat. 0 UEs, and if so, any issues
- Transmission mode(s) supported by Cat. 0 UEs
- Whether or not EPDCCH is supported
- Issues, if any, on coverage for TDD with Cat. 0 UEs
- Details of Category 0 to be incorporated into 36.306
- MBMS

Not treated.

R1-141941	On necessity of differentiating Cat 0 UEs and legacy UEs	Huawei, HiSilicon	
R1-141943	Transmission modes supported by low cost MTC UEs	Huawei, HiSilicon	
R1-141986	Other remaining issues on low complexity MTC UEs	CATT	
R1-141987	Discussion on the transmission modes supported by low complexity MTC UEs	CATT	
R1-142079	CAT 0 Compatibility Mode Standardization	Sierra Wireless	
R1-142080	Input on Remaining Details of CAT 0	Sierra Wireless	
R1-142088	Remaining Issues for New UE Category	Samsung	
R1-142089	Informing an eNB of New UE Category and Capability	Samsung	
R1-142132	Remaining details on low-cost MTC	LG Electronics	
R1-142165	Views on remaining issues for Low Cost MTC Ues	NEC	
R1-142181	Updated views on FFS on new UE category	Panasonic	
R1-142217	Remaining issues for low complexity MTC UEs	ZTE	
R1-142252	Remaining details of new UE category/type	NTT DOCOMO	
R1-142296	Remaining issues for low cost MTC	MediaTek Inc.	
R1-142342	Remaining Details on LC-MTC UE	InterDigital	
R1-142370	UE category parameters for low complexity UE	Ericsson	
R1-142371	Downlink transmission modes for low complexity UE	Ericsson	
R1-142372	Base station knowledge of low complexity UEs	Ericsson	
R1-142434	Remaining Details of Category-0 UE	NSN, Nokia	
R1-142473	Low-complexity UE single RX indication	Sony	
R1-142496	Remaining details of MTC UE category	Motorola Mobility	

6.2.2.2 Half-duplex FDD

Conclusion from RAN1#76bis:

- FFS till RAN1#77 focusing on at least the following areas:
  - Whether or not current specification is sufficient to handle Tx/Rx and Rx/Tx switching
  - Assumption of the number of local oscillators
  - #f HARQ processes
  - Soft buffer management
  - Impact, if any, on PDCCH monitoring and CSI reporting
  - Impact, if any, on PHICH handling

R1-141988	Remaining issues on low complexity HD-FDD UEs	CATT	

Decision: The document is noted.

R1-142090	HD-FDD for New Category UEs	Samsung	

Decision: The document is noted.

Revisit on Thursday

Friday 23rd

R1-141942	Discussion on HD-FDD operation of low cost MTC UEs	Huawei, HiSilicon	

Decision: The document is noted.

R1-142297	Remaining Issues of Low Cost HD-FDD Operation	MediaTek Inc.	

Decision: The document is noted.

Not treated.

R1-141953	Half-duplex operation for MTC	Qualcomm Inc.	
R1-142025	HD-FDD for low cost MTC UE	Intel Corporation	
R1-142037	Considerations on Low Cost MTC HD-FDD	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142133	HD-FDD support for low-cost MTC	LG Electronics	
R1-142218	Open areas on HD-FDD operation for low cost MTC UEs	ZTE	
R1-142253	Views on half duplex-FDD with single oscillator	NTT DOCOMO	
R1-142343	Discussion on LC-MTC HD-FDD UE	InterDigital	
R1-142373	Guard period for low complexity UE in half-duplex FDD	Ericsson	
R1-142374	Subframe timing conflict in half-duplex FDD	Ericsson	
R1-142436	Details of Half-Duplex Cat-0 UE	NSN, Nokia	

6.2.2.3 Other

R1-142699	Summary of offline discussion on low complexity MTC UE	Vodafone	

Decision: The document is noted.

Agreements:

- All HD FDD Cat-0 UEs are assumed to have 1 oscillator. Current RAN1 specification would be changed.
- The max # of DL and UL HARQ processes for Cat. 0 HD-FDD UEs are the same as those of Cat. 1 UEs

~~Working assumption (automatically confirmed if no issues raised by Friday):~~

Friday 23rd

Agreement:

- For Cat.0 MTC UEs, the supported PMCH TBS is updated in 36.306 to 4584 bits

R1-142701	Draft LS to RAN2 on 36.306 for low cost MTC UE	Huawei, HiSilicon	(R1-141945)

Decision: The document is noted and agreed in principle - revisit on Friday.

Friday 23rd: Final LS is agreed in R1-142745.

R1-142705	Draft LS on eNB knowledge of low complexity UEs	Ericsson	(R1-142703)

Decision: The document is noted.

Conclusion:

- Email approval of R1-142705 till June 4, 2014 – Johan (Ericsson)

- The conclusion on paging "it would be beneficial to extend the paging request signalling in order to provide eNB with knowledge that the paging request concerns a single antenna UE" is agreed in principle (the action to RAN3/SA2 can be further discussed over email)
- Regarding RAR, further discuss the wording on the tradeoff, but it is left to RAN2 to make the final decision

Agreements:
- Transmission mode(s) and EPDCCH supported by Cat. 0 UEs are the same as Cat. 1 UEs
- TTIBundling is supported for Cat.0 UEs

Send LS to RAN2 capturing the agreements in RAN1#77 for email approval until June 6 2014, and further include the following question – Eric (Vodafone)
- Question: has RAN2 already decided that it's up to UE implementation on how to handle parallel unicast and broadcast transmissions?

Not treated.

R1-142536	Low-complexity and coverage extended MTC in Rel-13	Sony	
R1-142540	Further Enhancements for MTC in LTE Rel-13	Ericsson, NSN	
R1-142541	On Reduced UE Bandwidth and Enhanced Coverage for MTC	Ericsson, NSN	

6.2.3 Small Cell Enhancements – Physical-layer Aspects

WID in RP-132073.

6.2.3.1 Higher order modulation

Specification of 256QAM in downlink transmission, with focus on the remaining design of MCS/CQI/TBS table, 256QAM related signalling, and adjustment on UE category

Design Details for 256QAM

R1-141932	CQI/MCS table design for 256QAM	Huawei, HiSilicon	

Decision: The document is noted.

R1-142578	Discussion on the remaining details of MCS / TBS table for 256QAM	Intel Corporation	(R1-142012)

Decision: The document is noted.

R1-142093	Discussion on 256QAM related signalling/procedure	Samsung	

Decision: The document is noted.

R1-142134	Remaining issues for supporting downlink 256QAM	LG Electronics	

Decision: The document (Except Section 5) is noted.

R1-142212	On configuration and design of 256QAM tables in downlink	ZTE	

Decision: The document is noted.

R1-142375	CQI and MCS table design for downlink 256QAM	Ericsson	

Decision: The document is noted.

R1-142425	Details on CQI/MCS Table Design for 256QAM	Microsoft Corporation	

Decision: The document is noted.

R1-142583	CQI table design for 256QAM	KT Corp.	(R1-142490)

Decision: The document is noted.

R1-142494	Gray mapping for 256QAM	Texas Instruments	

Decision: The document is noted.

The working assumption regarding the Gray mapping for 256QAM is confirmed:

- Adopt binary reflected Gray mapping for 256QAM shown as follows:

$$\frac{1}{\sqrt{170}}\{(1-2b_i)[8-(1-2b_{i+2})[4-(1-2b_{i+4})[2-(1-2b_{i+6})]]] + j(1-2b_{i+1})[8-(1-2b_{i+3})[4-(1-2b_{i+5})[2-(1-2b_{i+7})]]]\}$$

R1-142631	WF on I_MCS range for P-, SI- and RA- RNTIs	Intel Corporation, Nokia, NSN, CATT, Huawei, HiSilicon	

Decision: The document is noted. Discuss further offline.

R1-142638	WF on 256QAM CQI table design	Huawei, HiSilicon, CATR, Panasonic, III, CATT, Broadcom, Nokia, NSN, Microsoft, CMCC, CTC, Intel, Ericsson	

Decision: The document is noted. Also supported by KT, China Unicom.

The following working assumption for CQI table is confirmed
- down-sample low CQI entries by removing 3 QPSK entries, and add 3 new entries for 256QAM region

Working assumption:
- Spectrum efficiency (SE) for the first 256QAM entry is 5.5547
- Spectrum efficiencies (SE) for the middle 256QAM entries are {6.2237, 6.9153}

Agreement:
- Spectrum efficiency (SE) for the last 256QAM entry is 7.4063
- The 3 QPSK entries to be removed are existing {#2, #4, #6}

R1-142639	WF on 256QAM MCS table design	Huawei, HiSilicon, CATR, Panasonic, Microsoft, III, CATT, ZTE, CMCC, CTC, KT, Nokia, NSN, ZTE	

Decision: The document is noted.

For 256QAM MCS table, the following is agreed:
- Confirm the working assumption
  - the # of implicit entries is 4
- Remove entries with overlapping spectral efficiency but different modulation orders
- Retain I_TBS=0
- Remove at least existing MCS entries {#1, #3, #5, #7, #9, #10, #17, #28}

Working assumption:
- Not to additionally remove any other MCS entry or entries
- The positions of MCS indices are ordered based on spectral efficiency

Proposed agreements:
- Alt 1: The positions of MCS indices are ordered based on spectral efficiency
  - Huawei, HiSilicon, CATR, Panasonic, Microsoft, III, CATT, ZTE, CMCC, CTC, KT, Nokia, NSN, ZTE, Ericsson, ALU, ASB, Qualcomm
  - Objected by: Intel (less robust in ambiguity handling, potentially high specification impact, more UE impact)
- Alt 2: A common set of MCS indices are maintained between the legacy MCS table and the new MCS table
  - Intel
  - Objected by: Huawei, HiSilicon (RRC re-configuration ambiguity is not necessary to be further designed; no difference in terms of spec impact between Alt 1 and Alt 2, additional eNB mechanisms in handling two different tables)

Discuss offline on TBS table design, come back this week (Yuan, Huawei).

Wednesday 21st

R1-142648	Way Forward of 256QAM configuration	Ericsson, Nokia, NSN, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Fujitsu, CATT	

The document was presented by Mattias Frenne from Ericsson.
- For TM10, Alt.2 is selected: "CQI table is common for all CSI processes and MCS table is common for all PQI sets"
- For subframe sets, Alt.2 is selected: "The CQI table is common for all measurement subframe sets"

Discussion: Also supported by AT&T, NVIDIA, Intel, Microsoft
Objection from ZTE, Qualcomm, LGE, Samsung
Decision: The document is noted.

R1-142691	WF on 256QAM CQI/MCS table configuration	ZTE, Qualcomm, Blackberry, LGE, Samsung, China Telecom, Hitachi, CMCC	(R1-142645)

The document was presented by Zhisong Zuo from ZTE.
- If UE is in TM10, the use of 256QAM CQI table can be configured per each CSI process
  - 256QAM MCS table can be configured per each PQI

- 256QAM CQI table can be configured per each subframe measurement set

Discussion: Also supported by Panasonic, InterDigital, MotM, Broadcom
Objection from ALU, ASB, Ericsson
Mr Chair asked for any system level results showing the potential gain – ZTE (R1-142212), LGE (R1-142134) – performance results
Decision: The document is noted.

Working assumption:

- For TM10, CQI table is common for all CSI processes and/or Rel-11 subframe measurement sets and MCS table is common for all PQI sets
- For TM1-9, 256QAM CQI table can be configured per each Rel-11 subframe measurement set

Thursday 22nd

R1-142704	Offline discussion on TBS table design for 256QAM	Huawei, HiSilicon	

The document was presented by Ms Yuan Xia from Huawei and summarizes the views from offline discussion.
Decision: The document is noted.

Working assumption:

- Following CQI table is applied for 256QAM

CQI index	modulation	code rate x 1024	efficiency
0	out of range		
1	QPSK	78	0.1523
2	QPSK	193	0.3770
3	QPSK	449	0.8770
4	16QAM	378	1.4766
5	16QAM	490	1.9141
6	16QAM	616	2.4063
7	64QAM	466	2.7305
8	64QAM	567	3.3223
9	64QAM	666	3.9023
10	64QAM	772	4.5234
11	64QAM	873	5.1152
12	256QAM	711	5.5547
13	256QAM	797	6.2266
14	256QAM	885	6.9141
15	256QAM	948	7.4063

Working assumption:

- Non-highlighted TBS values in tables 4 and 5 in R1-142704
- Continue offline discussion on the highlighted TBS values with deleting the last row in table 5 and design principle until Friday – (Huawei)

Agreement: Same design principle is applied for TBS table used up to Rel-10

Friday 23rd

R1-142735	256QAM TBS table design	Huawei, HiSilicon	

The document was presented by Ms Yuan Xia from Huawei and provides the proposal for 256QAM entries in TBS table.a
Decision: The document is noted.

TBS_L1	TBS_L2	TBS_L3	TBS_L4
76208	152976	230104	305976
78704	157432	236160	314888
81176	161760	245648	324336
84760	169544	254328	339112
87936	175600	266440	351224
90816	181656	275376	363336
93800	187712	284608	375448
97896	FFS	FFS	FFS

Proposal: For the FFS values in above table (Table 2 of R1-142725 - one layer to two/three/four layer translation table), down-select between the following two options:
Option1: supported by CMCC, Huawei, HiSilicon, CATT, CATR, ZTE, MediaTek, Samsung, CHTTL

TBS_L2	TBS_L3	TBS_L4
193768	290664	387560

Option2: supported by Ericsson (option 1 is in contradiction with recent agreements), Broadcom, MotM, Nokia, LGE

TBS_L2	TBS_L3	TBS_L4
195816	293736	391656

Working assumption:

- TBS entries for 256QAM is table 1 and table 2 in R1-142735

For the FFS values in table 2 in R1-142735, continue discussion until RAN1 #78 meeting
Prepare draft LS (R1-142758) to RAN2 and RAN4 within today – Xia Yuan (Huawei)

Friday 23rd

R1-142758	[DRAFT] LS on 256QAM	Huawei	

Decision: The document is noted and final LS is agreed in R1-142767.

UE Category/Capability for 256QAM

R1-142692	WF on 256QAM UE category handling	Ericsson, CATT, III, Huawei, HiSilicon, Microsoft, AT&T, CMCC, ZTE, China Telecom, CATR, Blackberry	(R1-142637)

The document was presented by Daniel Larsson from Ericsson.

- UE categories 4, 5, 6, 7, 9 and 10 can indicate support for 256QAM
  - The field "Total number of soft channel bits" is not changed
  - Update two fields in UE category "Maximum number of DL-SCH transport block bits received within a TTI" and "Maximum number of bits of a DL-SCH transport block received within a TTI" to support 256QAM peak data rate
  - Whether or not the UE indicates support for 256QAM in a band specific or band agnostic manner should be decided by RAN4
    - The same UE 256QAM capability applies to the set of UE categories the UE indicates
- One new UE category with 256QAM is introduced
  - ~4Gbps targeting 5CC, 8 layer MIMO with 256QAM
  - "Total number of soft channel bits" [47 431 680 bits]

Discussion: Also supported by KT.
Objection from Qualcomm (second bullet to be deleted, no change of peak data rate and DL-SCH transport block bits), Broadcom (want to add two new UE categories and no change of peak data rate), MotM (no change of peak data rate and no change of 4, 5, 6, 7, 9 and 10 UE categories)
NTT DOCOMO may support assuming additional clarification on UE categories
NVDIA may support if Cat 4 & 5 are removed
MediaTek, LGE may support if categories 4 and 5 are removed
ALU, ASB may support if no change of peak data rate
NEC may support if no change of peak data rate, 4 to 8 UE categories + one more new category)
Decision: The document is noted.

- FFS: Whether and how to support UE categories 4 and 5

Continue offline discussion until Thursday – (Ericsson)

Thursday 22nd

R1-142647	Way Forward on 256QAM for PMCH	Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Verizon, AT&T	

The document was presented by Mattias Frenne from Ericsson.

- 256QAM is supported for PMCH
- Send an LS to inform RAN2

Discussion: Concern from Nokia/CATT → such feature could be postponed to future WI if required by operators
Objection from Nokia, ZTE, Blackberry, Huawei (out of the WI scope), HiSilicon, LGE
Ericsson/ALU suggested to leave it as FFS until the next meeting.
Mr Chair asked whether any other WGs will be impacted by such proposal→ yes according to ALU
Decision: The document is noted and is for email discussion until Thursday 5th June - (Ericsson)

Not treated.

R1-141933	Discussion on UE category with introduction of 256QAM	Huawei, HiSilicon	
R1-141954	Higher order modulation	Qualcomm Inc.	
R1-141955	UE Category handling for 256QAM	Qualcomm Inc.	
R1-141989	Remaining details in support of 256QAM	CATT	
R1-142013	Discussion on UE category for 256QAM	Intel Corporation	
R1-142038	Some remaining details of MCS/CQI/TBS Tables to support 256QAM	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142039	Configurations Supporting 256QAM	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142040	UE Categories supporting 256 QAM	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142091	CQI/MCS table design for 256QAM	Samsung	
R1-142092	UE category/capability for 256QAM	Samsung	
R1-142167	UE category to support 256QAM	NEC	
R1-142182	Open issues regarding 256QAM	Panasonic	(R1-141212 and R1-141213)
R1-142213	UE category design for 256 QAM	ZTE	
R1-142247	Discussion on Mechanism to Support 256QAM in TM 10	Hitachi Ltd.	
R1-142254	Remaining issues on 256 CQI/MCS table	NTT DOCOMO	
R1-142255	Views on UE categories for 256QAM	NTT DOCOMO	
R1-142274	Remaining Details of 256 QAM	Broadcom Corporation	
R1-142275	Discussions on UE Category with introduction of 256 QAM	Broadcom Corporation	
R1-142308	UE category definitions for 256QAM	NVIDIA	
R1-142353	Remaining Issues for 256 QAM Configuration and Signalling	BlackBerry UK Limited	
R1-142354	On UE Category/Capability Handling to Support 256 QAM	BlackBerry UK Limited	
R1-142365	Discussions on 256QAM	CATR	
R1-142376	TBS table design for downlink 256QAM	Ericsson	
R1-142377	Gray mapping for 256QAM	Ericsson	
R1-142378	UE category solution for 256QAM support	Ericsson	
R1-142379	On 256QAM configuration	Ericsson	
R1-142380	256QAM for PMCH transmissions	Ericsson	
R1-142426	UE Category Adjustment with 256QAM	Microsoft Corporation	
R1-142437	On the final CQI table design details	Nokia, NSN	
R1-142438	On UE categories for 256QAM support	Nokia, NSN	
R1-142497	Remaining details of MCS and TBS signaling for support of 256-QAM	Motorola Mobility	
R1-142498	UE category in support of 256-QAM	Motorola Mobility	
R1-142505	Discussions on UE categories supporting 256QAM	CMCC	
R1-142506	TBS design for 256QAM	CMCC	
R1-142584	MCS/TBS table design for 256QAM	KT Corp.	(R1-142491)
R1-142640	WF on TBS design for 256QAM	CMCC, Huawei, Hisilicon, CHTTL, ZTE	
R1-142641	WF on UE processing capability	CMCC, CATT	
R1-142751	WF on the remaining TBS table design for 256QAM	CMCC, Huawei, Hisilicon, CHTTL, ZTE, CATT, CATR, MediaTek	

6.2.3.2 Small cell on/off and discovery

Solutions for reduced transition time of small cell on/off in single-carrier or multi-carrier operation, with enhanced discovery of small cells

6.2.3.2.1 Procedures for small cell on/off transition time reduction

Wednesday 21st session

R1-142690	WF on small cell on/off transition time reduction for Scells	Ericsson, Panasonic, NTT DOCOMO, Fujitsu, LG Electronics	

The document was presented by Sorour Falahati from Ericsson.

- The UE can assume whether a subframe on an activated SCell is ON or OFF based on at least cross-carrier scheduling
  - FFS: Self-scheduling on the SCell or cross-carrier scheduling based on configuration
  - The UE cannot assume that CRS are present in any DL subframe other than DL subframes scheduled or configured for the discovery signal if CRS is included in DRS
  - The DRS periodicity is intended to support time and frequency tracking at the UE
  - The UE can assume that the configured discovery burst and any CSI-RS configured for CSI reporting are always transmitted
- The UE DRX configuration is applicable for the SCell operating small cell on/off

Discussion: Panasonic: Above proposal is not new.
ALU: How can the WF work on quasi collocation scenario? → Ericsson: by using DRS
MotM: What is the impact on CRS based transmission scheme?
Decision: The document is noted. Continue offline discussion until Thursday – (Ericsson)

Thursday 22nd

R1-142722	WF on small cell on/off transition time reduction for Scells	Ericsson	(R1-142690)

The document was presented by Sorour Falahati from Ericsson.

- A UE can assume a subframe on an activated SCell is ON or OFF based on at least cross-carrier scheduling
  - FFS: Self-scheduling on the SCell or cross-carrier scheduling based on configuration
  - The UE can assume that on an activated SCell, the CRS are only present in the following DL subframes:
  - DL subframes scheduled with DL assignment
  - DL subframes configured for
    - Discovery signal
    - CSI-RS transmissions
      - CSI reporting uses existing configurations, e.g., periodicity of 5, 10, 20 subframes etc.
    - Periodic CRS transmissions
      - The periodicity of the CRS in configured subframes is intended to support time and frequency tracking at the UE
  - FFS: DL subframes indicated as being ON with an ON/OFF indicator
- The UE DRX configuration is applicable for the SCell operating small cell on/off

Discussion: NSN: Interesting but definitely more time required for detailed checking.
Samsung concern on how the periodicity of transmissions may impact the performamces → simulation results
Huawei expressed fustration as many "good" proposals have not been considered due to time constraints
Decision: The document is noted and is for email discussion until 17th June - (Ericsson)

Agreement:

- Minimize RAN2 impact by small cell on/off transition time reduction in addition to DRS-based measurement

Mr Chair agreed looking at some other contributions.

R1-141918	New L1 procedure for small cell on/off transition time further reduction	Huawei, HiSilicon	

The document was presented by Weimin Xiao from Huawei and proposes:
Proposal 1 The new L1 procedure should first be supported in synchronized scenarios in CA.
Proposal 2 Down select from the alternatives for the guidelines for the new L1 procedure, in particular:

- Decide that CSI should be made available based on RS periodic but sparse in time domain or RS sent together with DL data;
- For synchronized scenarios, the time/frequency tracking of Scell can rely on the Pcell and no tracking delay will be incurred; for un-synchronized or coarse-synchronized scenarios, the number of initial subframes for time/frequency tracking depends on the decision of DRS design and RAN4 decision;
- AGC settling time may be at most 2 OFDM symbol durations of 140 ms.

Proposal 3 Focus on defining the explicit DCI message to support Scell on/off and the associated UE monitoring behaviors.
Decision: The document is noted.

R1-142298	Layer-1 procedure enhancements for fast small cell on/off operation	MediaTek Inc.	

The document was presented by … from MediaTek and proposes:
Proposal #1: For UE power efficiency, there are two options and each option can achieve the same UE power efficiency and throughput. FFS which option.
- Option #1: Explicit L1 signaling with short DRX operation
- Option #2: Explicit L1 signaling with newly defined sub-state for reduced UE functions in continuous reception

Proposal #2: UE-specific DCI message is utilized to notify a UE when it can assume a small cell is in "on" state.
Proposal #3: For UE power saving, the explicit L1 signaling is transmitted in a set of subframes within a radio frame.
Proposal #4: For UE power saving, a UE is allowed to turn off all functions except the following when it can assume the serving small cell is in "off" state.
- DRS-based RRM measurements/reporting
- DRS-based CSI measurements/reporting
- PDCCH monitoring for the explicit L1 signaling in a set of subframes within a radio frame

Proposal #5: The explicit L1 signaling includes the information of both starting subframe and subframe length a UE can assume the signaling small cell is in "on" state.
Proposal #6: For uplink, non-contention-based uplink triggering signaling is utilized for a UE to trigger an "off" small cell so as to reduce the latency of uplink data transmission.
- FFS which uplink physical signal, e.g. PRACH, PUCCH or PUSCH

Proposal #7: In carrier aggregation, explicit L1 signaling can be transmitted on either Pcell from a macro cell or a Scell from a small cell.
Proposal #8: In dual connectivity, explicit L1 signaling is transmitted on pScell from a small cell.
Decision: The document is noted.

R1-142695	Way Forward on New L1 Procedure for Small Cell ON/OFF	NSN, Nokia, Broadcom, Motorola Mobility, NVIDIA	

The document was presented by Timo Lunttila from NSN.
- ON/OFF operation based on CA Activation / Deactivation signalling is supported in Rel-12
  - The UE may not assume presence of any signals other than DRS when a cell is deactivated until an activation command is received
  - Aim at reducing activation / deactivation delay from the currently specified values (in 36.133)
- FFS: ON/OFF operation based on DRX configuration
- No further enhancements to ON/OFF switching are specified in Rel-12

Discussion: Ericsson: First and last bullets are not aligned with WID, not clear FFS point
ALU: How can the WF work on quasi collocation scenario?
Decision: The document is noted. Continue offline discussion.

Not treated.

R1-141956	Small cell on/off time reduction	Qualcomm Inc.	
R1-141990	Procedures for small cell on/off transition time reduction	CATT	
R1-142026	Transition time reduction for small cell on/off	Intel Corporation	
R1-142041	System design for transition time reduction for small cell ON/OFF	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142042	Consideration of New L1 signaling for transition time reduction of SCell Activation for Small Cell ON/OFF	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142065	Discussion of on/off transitions and related procedures	Fujitsu	
R1-142094	Procedures for small cell on/off transition time reduction	Samsung	
R1-142135	Detailed discussions on new L1 procedure to support fast time-scale on/off operation	LG Electronics	
R1-142183	Small cell on/off using DRX procedure	Panasonic	
R1-142199	L1 procedure for small cell on/off	Sharp	
R1-142239	Procedures for small cell on/off transition time reduction	ZTE	
R1-142243	Performance of small cell on/off with different CSI assumptions	ITRI	
R1-142248	Indication of cell transmission to UEs	Hitachi Ltd.	
R1-142256	New L1 procedure for small cell on/off	NTT DOCOMO	
R1-142257	Views on transition time reduction for small cell on/off	NTT DOCOMO	
R1-142276	Small Cell On/Off procedures	Broadcom Corporation	

R1-142289	Discussion on L1 procedure to further reduce the transition time of small cell on/off	HTC	
R1-142309	Small cell on/off transition time reduction	NVIDIA	
R1-142333	Other aspects related to small cell on/off and discovery	Huawei, HiSilicon	
R1-142344	Small cell on/off transition time reduction	InterDigital	
R1-142366	Small cell on/off time reduction for activated SCell	CATR	
R1-142368	Enhanced L1 procedure for activated SCell operating on/off	China Telecom	
R1-142381	Comparison between different New L1 Procedures	Ericsson	
R1-142382	Performance Evaluations of different New L1 Procedures	Ericsson	
R1-142383	Standardization impact to support on/off based on CA activation/deactivation	Ericsson	
R1-142384	Standardization impact to support on/off based on Handover	Ericsson	
R1-142412	Discussion on small cell on/off transition time reduction	Coolpad	
R1-142439	On procedures for small cell on/off transition time reduction	NSN, Nokia	
R1-142476	Views on small cell on/off procedures	CHTTL	
R1-142542	Small Cell On Off using UL sensing	CEWiT	
R1-142587	The small cell on/off state indication by DCI format	ITL Inc.	(R1-142529)
R1-142633	Further discussion on procedures for small cell ON/OFF	Motorola Mobility	(R1-142499)

6.2.3.2.2 Performance Evaluation on Discovery signals

Mr Chair's recommendation: Focus on the evaluation of cell detection and RSRP measurement

R1-141934	Summary of performance evaluations of DRS	Huawei, HiSilicon	

The document was presented by David Mazzarese from Huawei and provides further analysis of the possible enhancements to the efficient discovery of small cells. Since CSI-RS provides better performance than CRS, the following is proposed:

- Proposal 1: Alt.3b (DRS is PSS/SSS/CSI-RS) should be selected for the design of DRS. Alt.5 (DRS is PSS/SSS/CSI-RS/CRS or PSS/SSS/CSI-RS with configurability) may also be considered.
- Proposal 2: DRS-based RRM measurements should allow UEs to reliably detect more than one cell (i.e. meeting the RRM measurement requirements including side conditions) in all Rel-12 SCE scenarios.

Decision: The document is noted.

R1-142310	Evaluation of discovery signals for RRM measurements	NVIDIA	

The document was presented by Tommi Koivisto from NVIDIA and draws the following observations:

- With muting, sufficient RSRP measurement performance is obtained in SCE scenario 2a for top three cells with either CRS or CSI-RS.
- Without muting, good RSRP measurement performance is obtained in SCE scenario 2a for the strongest cell with either CRS or CSI-RS.
  - With CRS, also 2nd and 3rd cell can be reasonably well measured.
  - With CSI-RS, there is a clear performance degradation for 2nd and 3rd cells due to inter-cell interference.

Decision: The document is noted.

R1-142027	Simulation results for small cell discovery signals	Intel Corporation	

The document was presented by Seunghee Han from Intel and is summarized as follows:

- Observation 1: The following options can fulfill the 90% detection probability threshold for the first three strong cells:
  - PSS/SSS muting with L=5 and L=10
  - PSS/SSS TDM with reuse 5 and 10
  - PSS/SSS IC with 2 cancellations
- Observation 2: From the simulation results, it is observed that the RSRP measurement accuracy using CRS is superior to that using CSI-RS with the gain ranging from 0.82 dB to 1.13 dB in terms of delta RSRP under the provided simulation assumptions.

Decision: The document is noted.

R1-142258	Performance evaluation on DRS-based cell/TP identification and RSRP measurement	NTT DOCOMO	

The document was presented by Hiroki Harada from NTT DoCoMo and is summarized below.

- Observation 1: The CSI-RS exhibits the best performance of cell/TP identification in a dense small cell deployment since the RS resource collision among small cells within a cluster can be avoided by utilizing a number of orthogonal configurations with the muting mechanism.
- Observation 2: The CSI-RS exhibits the most accurate RSRP measurement performance especially for the second and third best RSRP small cells in a dense small cell deployment.

- Observation 3: The CRS-based RSRP measurement is slightly more robust than the CSI-RS-based RSRP measurement in a noise limited scenario.
  - The CSI-RS can also meet the RSRP absolute accuracy requirement with a sufficient margin when averaging among a few measurement samples or when a large measurement bandwidth such as over 25 RBs is applied.
  - For the CSI-RS, multiple configurations can be assigned to a certain cell/TP so that the RE density and corresponding link-level RSRP measurement accuracy is comparable to the CRS.

Decision: The document is noted.

R1-142299	Performance evaluation of cell detection and RSRP measurement for discovery signal designs	MediaTek Inc.	

The document was presented by Peikai Liao from MediaTek and concludes:

- Observation #1: Both CRS with IC and RE muting and CSIRS with network planning can achieve least 90% cell detection rate up to 4 small cells.
- Observation #2: Both CRS with IC and RE muting and CSIRS with network planning can achieve less than 6dB absolute RSRP measurement error up to 4 small cells.
- Observation #3: CRS-based RSRP measurement is more robust to residual synchronization error after coarse synchronization and provides better performance when inter-cell interference is reduced.
- Proposal #1: For robust RSRP measurement in asynchronized/sparse small cell deployment, CRS should be included in the discovery signal.
- Proposal #2: For further enhancement on RSRP measurement in synchronized/dense small cell deployment, CSI-RS can be included in the discovery signal.

Decision: The document is noted.

R1-142594	Summary on performance evaluation results	NTT DOCOMO, Huawei, HiSilicon	

The document was presented by Hiroki Harada from NTT DOCOMO.

- In dense small cell deployment scenario, the muting mechanism is needed for CRS and CSI-RS to achieve accurate RSRP measurement especially for second and third best RSRP cell/TP.
  - CSI-RS performs better in dense deployment and can detect more cells due to higher reuse
  - CRS performs better in sparse deployment or asynchronous case
    - In single cell/TP scenario, i.e., noise limited case, CSI-RS can achieve the comparable performance to CRS when the number of measured REs of CSI-RS is comparable to that of CRS.

Discussion: Intel cannot agree on first sub-bullet – RSRP measurement accuracy using CRS overperforms that using CSI-RS
Proposal also supported by MediaTek. Similar view from Qualcomm.
Qualcomm/Ericsson: muting mechanism not needed for CSI-RS
NSN → is CRS Rel-8 CRS?
NSN asked clarifying CSI-RS we are talking about → is CSI-RS multiple configurations or not?
DOCOMO: We can assume multiple measurement REs or wider measurement bandwidth
NSN: What does wider measurement bandwidth mean?
DOCOMO: Current measurement bandwidth is 6 RB. In noise limited scenario, performance depends on the number of measured REs.

Decision: The document is noted.

Possible observations:

- In dense small cell deployment scenario, the muting mechanism is needed for CRS and CSI-RS to achieve accurate RSRP measurement especially for second and third best RSRP cell/TP
  - CSI-RS performs better in dense deployment and can detect more cells due to higher reuse
    - Objected by Intel, Qualcomm
  - CRS performs better in sparse deployment or asynchronous case
    - In single cell/TP scenario, i.e., noise limited case, CSI-RS can achieve the comparable performance to CRS when the number of measured REs of CSI-RS is comparable to that of CRS
      - Objected by Qualcomm

Continue offline discussion until Wednesday – Weimin (Huawei)

Wednesday 21st

R1-142689	DRS Evaluation Observation	Huawei, HiSilicon, NTT DOCOMO	

The document was presented by Weimin Xiao from Huawei.

- DRS design needs to consider tradeoff of levels of interference coordination (synchronization level, number of supported reuse, and inter-eNB planning) versus total received power (RE density X number of measured subframes and BW):
  - With no interference coordination (including sparse deployment) or in asynchronous scenario, CRS performs better.
    - As shown in the evaluation results for equally low SINR region
  - With good level of interference coordination, CSI-RS performs better with larger number of detectable cells and better RRM accuracy for weaker cells
    - Higher SINR experienced by CSI-RS in dense deployment when interference coordination is implemented
- DRS design that allows configurability of CRS-based and/or CSI-RS-based small cell discovery and RRM measurement is beneficial

Discussion: Intel→ replace "With good level of interference coordination" by "In some cases"
NVDIA concern with last bullet, prefer to remove it
Qualcomm→ rephraze last bullet as "… CRS-based or CRS-based + CSI-RS-based…"
Samsung→ add "… CSI-RS-based only…"
Decision: The document is noted.

Observations:

- DRS design needs to consider tradeoff of levels of interference coordination (synchronization level, number of supported reuse, and inter-eNB planning) versus total received power (RE density X number of measured subframes and BW):
  - With no interference coordination (including sparse deployment) or in asynchronous scenario, CRS performs better.
    - As shown in the evaluation results for equally low SINR region
  - In some cases, CSI-RS performs better with larger number of detectable cells and better RRM accuracy for weaker cells
    - Higher SINR experienced by CSI-RS in dense deployment when interference coordination is implemented
- DRS design that allows configurability of reporting both CRS-based and CSI-RS-based small cell discovery RRM measurement is beneficial

Not treated.

R1-141957	Performance Evaluation on Discovery signals	Qualcomm Inc.	
R1-141991	Evaluation on small cell discovery signal	CATT	
R1-142095	Performance evaluation on discovery signals	Samsung	
R1-142136	Cell detection performance with discovery signals	LG Electronics	
R1-142277	Performance evaluations for cell detection and RSRP measurement	Broadcom Corporation	
R1-142345	System-level performance evaluation of discovery signals	InterDigital	
R1-142385	Performance evaluations for discovery signals	Ericsson	
R1-142440	Small Cell Detection Statistics and Related Considerations	NSN, Nokia	
R1-142507	Performance evaluation of discovery reference signals	CMCC	

6.2.3.2.3 Detailed design of Discovery signal(s)

Mr Chair's recommendation: Focus on the down selection of the discovery signal(s) and the functions associated with the reference signals

R1-142441	Discovery Signal Design	NSN, Nokia	

The document was presented by Timo Lunttila from NSN and concludes:

- Observation #1: Discovery signals should ensure simple and efficient discovery operation also in the presence of legacy cells not transmitting any DS.
- Observation #2: CRS-based RRM measurements are a prerequisite for TP identification.
- Proposal #1: Discovery signals shall include at least one CRS antenna port to facilitate RRM measurements comparable to existing RSRP/RSRQ.
- Observation #3: TP identification based on UL signals does not require any standards changes and should be considered as the baseline.
- Proposal #2: Further RAN1 studies on discovery signals shall focus on enhancing the discovery of dormant small cells based on bursty transmission of PSS/SSS and CRS signals.
- Observation #4: Having CRS as part of DS in addition to PSS/SSS does not have any clear drawbacks.

Decision: The document is noted.

R1-142096	Detailed design of discovery signal	Samsung	

The document was presented by Hyojin Lee from Samsung and proposes:

- Proposal 1: For enhanced cell discovery, PSS/SSS of a cell in a small cell cluster can be used for coarse time and frequency synchronization for detecting the DRS of another cell in the same cluster.
- Proposal 2: A set of PCIs can be configured to indicate a PSS/SSS set that can be used for coarse time and frequency synchronization for detecting a DRS resource.
- Proposal 3: For enhanced cell discovery, CSI-RS is the DRS for cell/transmission point identification and RSRP/RSRQ measurement.

Discussion: Intel requested having a look to Fig1, Fig2 of R1-142028)
Decision: The document is noted.

R1-142028	Details on small cell discovery signal	Intel Corporation	

The document was presented by Seunghee Han from Intel.
Decision: The document is noted.

R1-142593	WF on discovery signal	NTT DOCOMO, Samsung, Sharp, LG Electronics, Panasonic, Fujitsu, ZTE, ETRI, Huawei, HiSilicon, Sony	

The document was presented by Hiroki Harada from NTT DOCOMO.

- DRS burst includes at least CSI-RS in addition to PSS/SSS
  - Down select the DRS design from Alt. 1, Alt. 3b and Alt. 5
  - CSI-RS based RRM measurement should be specified to ensure the comparable RRM performance to the legacy CRS-based RRM measurement in the single cell/TP case

Discussion: How to support TP identification in the shared cell ID scenario in each alternative DRS design:

- Alt. 1 (PSS/SSS/CRS or PSS/SSS/CRS/CSI-RS)
  - Configure CSI-RS based RRM measurement
  - supported by MediaTek, Panasonic, NTT DoCoMo, Fujitsu, Huawei, HiSilicon, InterDigital, ETRI, Ericsson, LGE, Cisco
- Alt. 3a (PSS/SSS/CRS) supported by CATT, Intel, NSN, Qualcomm, Microsoft, Broadcom, Nokia, ALU, ASB, MotM, Broadcom
  - 3a-1 UL based approach (implementation) supported by NSN, CATT, NVIDIA, Microsoft, Nokia, ALU, ASB, Qualcomm, MotM, Broadcom
  - Comment from LGE: how alt.3a-1 can work with TP identification
  - 3a-2 Muting pattern or DRS configuration/offset based approach supported by Intel
- Alt. 3b (PSS/SSS/CSI-RS)
  - CSI-RS based RRM measurement is available
  - supported by NTT DOCOMO, Sharp, Samsung, Huawei, Hisilicon, Hitachi, ETRI, LGE, Fujitsu, InterDigital, ZTE, Cisco
- Alt. 5 (PSS/SSS/CSI-RS or PSS/SSS/CSI-RS/CRS)
  - CSI-RS based RRM measurement is available
  - supported by NTT DOCOMO, InterDigital, Huawei, HiSilicon

Decision: The document is noted. Continue offline discussion until Wednesday – (NTT DOCOMO)

Wednesday 21st

R1-142688	WF on discovery signal	NTT DOCOMO, Sharp, Panasonic, ZTE, NSN, Nokia, Huawei, HiSilicon, LG Electronics, Ericsson, Fujitsu, Sony	

The document was presented by Hiroki Harada from NTT DOCOMO.

- Down select to Alt.1 as Rel-12 DRS design
  - UE can be configured with CRS-based and/or CSI-RS-based RRM measurement reporting as the DRS-based measurement
    - If CSI-RS-based RRM measurement reporting is configured:
      - UE assumes PSS/SSS/CRS/CSI-RS in the DRS
      - UE reports CSI-RS-based RSRP/RSRQ and associated PCID and TPID
        - » TPID may be represented by e.g., CSI-RS RE configuration, Scrambling ID, Subframe offset, cover code or their combination
    - If CRS-based RRM measurement reporting is configured:
      - UE assumes PSS/SSS/CRS in the DRS
      - UE reports CRS-based RSRP/RSRQ and associated PCID
    - If both reportings are configured:

  - UE assumes PSS/SSS/CRS/CSI-RS in the DRS
  - UE reports both

Discussion: Qualcomm→ CRS-based RRM measurements reporting is always configured for DRS, additionally CSI-based RRM measurements reporting can be configured for DRS
Decision: The document is noted.

Agreements:

- UE assumes PSS/SSS/CRS in the DRS
  - Additionally CSI-RS is assumed in the DRS for measurement if configured by higher layers
- CRS-based RSRP measurements are supported, and CSI-RS –based RSRP measurements are supported
- UE may report DRS-based RSRP/RSRQ and associated PCID and information for TP identification
- RRM measurement configuration and reporting details are up to RAN2
- Prepare draft LS to RAN2 within today – Hiroki (NTT DOCOMO)

R1-142694	[Draft] LS on small cell discovery signal	NTT DOCOMO	

The document was presented by Hiroki Harada from NTT DOCOMO.
Discussion: Huawei → should not RAN4 be in action?
Decision: The document is noted and final LS is agreed in R1-142698, assuming the following update:
RAN1 is still discussing whether DRS based RSRQ measurement(s) should be defined for ~~based on~~ CRS, CSI-RS or both.
2. Actions:

RAN1 kindly asks RAN2 and RAN4 to take the above into account for future discussion on the work item of small cell enhancements-physical layer aspect.

Possible agreements:

- Down select to Alt.1 as Rel-12 DRS design
  - UE can be configured with CRS-based and/or CSI-RS-based RSRP/RSRQ measurement reporting as the DRS-based measurement
    - If CSI-RS-based RSRP/RSRQ measurement reporting is configured:
      - UE assumes PSS/SSS/CRS/CSI-RS in the DRS
      - UE may report CSI-RS-based RSRP/RSRQ and associated PCID and information for TP identification
        - » TP identification may be represented by e.g., CSI-RS RE configuration, Scrambling ID, Subframe offset, cover code or their combination
    - If CRS-based RSRP/RSRQ measurement reporting is configured:
      - UE assumes PSS/SSS/CRS in the DRS
      - UE may report CRS-based RSRP/RSRQ and associated PCID
    - If both reportings are configured:
      - UE assumes PSS/SSS/CRS/CSI-RS in the DRS
      - UE may report both CSI-RS-based RSRP/RSRQ measurement and CRS-based RSRP/RSRQ measurement and associated PCID and information for TP identification

Continue offline discussion until Thursday – Hiroki (NTT DOCOMO)

Thursday 22nd : NTT DOCOMO introduced the following contribution.

R1-142718	Offline discussion summary for discovery signal details	LG Electronics, NTT DOCOMO, Ericsson, Fujitsu, NEC, Sharp	

The document was presented by Ms Yunjung Yi from LGE.
Proposal on UE assumption on signals while in small cell discovery procedure

- For the purpose of DRS based measurements, the UE shall only assume the presence of signals of the DRS
- For a UE configured with only DRS-based measurements reporting on a given carrier frequency, and not configured with an activated serving cell on that carrier frequency
  - The UE shall (should) not assume the presence of any signal and channel except for DRS in the DMTC (DRS measurement timing configuration) duration

DRS Scrambling ID

- Scrambling ID of PSS/SSS/CRS is PCID
- Scrambling ID of CSI-RS may be different from PCID
- TP identification may be represented by e.g., CSI-RS RE configuration, Scrambling ID, Subframe offset, cover code or their combination
  - FFS on details

DRS subframe configuration

- A UE assumes that a DRS occasion consists of
  - One instance of PSS/SSS per Rel-8

  - CRS is transmitted at least in the same subframe as SSS
  - none or one (FFS on more than one) subframe of CSI-RS
  - Relative subframe offset between SSS and CSI-RS can be
    - Variable within 5msec in a range of [0, +4] relative to subframe of SSS
    - FFS on fixed [0, +4] relative to subframe of SSS
- A DRS occasion comprises N consecutive subframes (N <=5)
  - FFS on DRS transmission on MBSFN, if so, how
  - FFS between
    - One or more subframes among N subframes may not carry any DRS signal
    - All DL subframes carry DRS signal
- A DRS occasion is transmitted every *M* ms
  - Candidate values for *M* are 40, 80, 160, FFS on other values

Decision: The document is noted.

Agreement:
- For the purpose of DRS based measurements, the UE shall only assume the presence of signals of the DRS

Agreement:
- For both intra- and inter- frequency measurement, if a UE is configured with only DRS-based measurements reporting on a given carrier frequency, and UE is not configured with an activated serving cell on that carrier frequency, the UE shall (should) not assume the presence of any signal and channel except for DRS in the DMTC (DRS measurement timing configuration) duration

Agreements:
- For DRS,
  - Scrambling ID of PSS/SSS/CRS is PCID
  - Scrambling ID of CSI-RS may be different from PCID
- TP identification may be represented by e.g., CSI-RS RE configuration, Scrambling ID, Subframe offset, cover code or their combination
  - FFS on details

Agreements:
- DRS can only be transmitted on a DL subframe or DwPTS region of subframes
- For DRS-based measurement, a UE assumes that
  - A DRS occasion for a cell consists of
    - One instance of PSS/SSS per Rel-8
    - CRS is transmitted at least in the same subframe(s) as PSS/SSS
    - A DRS occasion can comprise multiple CSI-RS RE configurations
      - The different CSI-RS configurations may be in the same or different subframe(s)
      - The different CSI-RS configurations may be scrambled independently
    - Relative subframe offset between SSS and one CSI-RS RE configuration
      - FFS between variable or fixed within 5 msec relative to subframe of SSS
  - A DRS occasion for a cell comprises N consecutive subframes (N <= 5)
    - FFS on DRS transmission on MBSFN subframe, if so, how
    - FFS between
      - One or more subframes among N subframes may not carry any DRS signal (i.e., either CRS or CSI-RS)
      - All DL subframes carry DRS signal
  - A DRS occasion for a cell is transmitted every *M* ms
    - Candidate values for *M* are 40, 80, 160, FFS on other values
- Note: RAN1 design does not assume any requirements of the number of detectable cells using DRS

Continue offline discussion until Friday focusing on DRS design until Friday – Yunjung (LG), Hiroki (NTT DOCOMO)

R1-142725	[DRAFT] LS on discovery signal details	LGE	R1-142733

The document was presented by Ms Yunjung Yi from LGE and informs RAN2 and RAN4 of above agreements.
Decision: The document is noted and final LS is agreed in R1-142733.

Note:
Open issues impacting RAN2 and/or RAN4
- Possible network assistance regarding DRS timing configuration
  - allowed measurement bandwidth

  - periodicity
  - duration
- Possible network assistance regarding DRS occasion configuration
  - CSI-RS configuration
  - List of candidate cells/TPs information
  - MBSFN, TDD DL/UL configuration
- Measurement gap
- UE measurement behavior in cell on/off, DRX, activated/deactivated SCell
- RSSI definition and RSRQ definition/support

Continue offline discussion within today – Hiroki (NTT DOCOMO)

Thursday evening

R1-142737	WF on additional network assistance information	NTT DOCOMO, Fujitsu, Sony	

The document was presented by Hiroki Harada from NTT DOCOMO.

- In addition to DRS-based measurement timing configuration, following assistance information can be informed to UE
  - Information per carrier frequency including all or some of:
    - Duration of DRS occasion
    - Maximum allowed measurement bandwidth
  - Information per candidate cell/TP including all or some of:
    - CSI-RS RE configuration corresponding to X REs/PRB
      - FFS X is fixed or configurable
    - Scrambling ID of CSI-RS
    - Scrambling ID of CRS
    - CSI-RS subframe offset relative to SSS
    - QCL relationship between PSS/SSS/CRS and CSI-RS
  - FFS other information

Decision: The document is noted.

Possible agreements:

- In addition to DRS-based measurement timing configuration, following assistance information can be informed to UE
  - Information per carrier frequency including all or some of:
    - FFS: Duration of DRS occasion
    - FFS: Maximum allowed measurement bandwidth
    - For each cell, information per candidate cell/TP including all, some, none of :
      - PCID
      - For each CSI-RS configuration,
        - CSI-RS RE configuration corresponding to X REs/PRB
          - FFS X is fixed or configurable
        - CSI-RS subframe offset relative to SSS
        - Scrambling ID of CSI-RS
        - QCL relationship between PSS/SSS/CRS and CSI-RS
  - FFS other information

Friday 23rd

R1-142752	WF on details on discovery signal design	LG Electronics, NTT DOCOMO, Huawei, HiSilicon, Samsung	

The document was presented by Ms Yunjung Yi from LGE.

- UE can assume CRS for a cell is transmitted on all DL subframe and DwPTS regions of subframes within a DRS occasion
- For DRS-based measurement, number of consecutive subframes (N<=5) should be discussed for CRS-based measurement in RAN4
- For DRS-based measurement, only one subframe carries one CSI-RS RE configuration where the relative subframe offset between SSS and one CSI-RS RE configuration can be different for different CSI-RS RE configurations
- Working assumption
  - Single antenna port with 2 REs per PRB of CSI-RS RE configuration is supported for CSI-RS based RSRP. Legacy OCC [+1,+1] or [+1,-1] can be applied to the single antenna port.
  - Revisit if RAN4 finds an issue
- Measurement bandwidth should be discussed in RAN4

Decision: The document is noted and is modified as follows:

Possible agreements:

- UE can assume at least CRS antenna port 0 for a cell is transmitted on all DL subframe and DwPTS regions of subframes within a DRS occasion

  - CRS transmission on MBSFN subframe is per Rel-8
- Requirements on measurement bandwidth and periodicity of a DRS occasion should be discussed in RAN4
- For DRS-based measurement, only one subframe carries one CSI-RS RE configuration where the relative subframe offset between SSS and one CSI-RS RE configuration can be different for different CSI-RS RE configurations
  - Working assumption
    - Single antenna port with 2 REs per PRB of CSI-RS RE configuration is supported for CSI-RS based RSRP. Legacy OCC [+1,+1] or [+1,-1] can be applied to the single antenna port.
    - Revisit if RAN4 finds an issue

Continue offline discussion within today – Yunjung (LG)

Possible agreements:

- UE can assume that at least CRS antenna port 0 for a cell is transmitted on all DL subframe and DwPTS regions of subframes within a DRS occasion
  - If UE is indicated with MBSFN subframe configuration, UE assumption of CRS transmission on MBSFN subframe is per Rel-8
- Configuring REs for CSI-RS as DRS does not change the PDSCH/EPDCCH rate matching patterns
- Requirements on measurement bandwidth, periodicity, and duration of a RS occasion should be discussed in RAN4
- For CSI-RS as DRS,
  - At least single antenna port 15 with 2 REs per PRB of CSI-RS RE configuration is supported for CSI-RS based RSRP
  - For DRS-based measurement, only one subframe carries one CSI-RS RE configuration where the relative subframe offset between SSS and one CSI-RS RE configuration can be different for different CSI-RS RE configurations

Possible agreements:

- Requirements on measurement bandwidth, periodicity, and duration of a RS occasion should be discussed in RAN4
- For CSI-RS as DRS,
  - At least single antenna port 15 with 2 REs per PRB of CSI-RS RE configuration is supported for CSI-RS based RSRP
- In a DRS occasion, the relative subframe offset between SSS and one CSI-RS RE configuration can be different for different CSI-RS RE configurations
- For each CSI-RS RE configuration in a DRS occasion, a UE can assume that the corresponding CSI-RS is transmitted in one (FFS more than one) subframe
- FFS: A UE can assume that at least CRS antenna port 0 for a cell is transmitted on all DL subframe and DwPTS regions of subframes within a DRS occasion
  - If UE is indicated with MBSFN subframe configuration, UE assumption of CRS transmission on MBSFN subframe is per Rel-8
- FFS: Configuring REs for CSI-RS as DRS does not change the PDSCH/EPDCCH rate matching patterns

Email approval until 2nd June – Yunjung (LG)

Not treated.

R1-141935	DRS functions and design options	Huawei, HiSilicon	
R1-141958	Detailed design of DRS	Qualcomm Inc.	
R1-141992	Design of small cell discovery signal	CATT	
R1-142043	CRS-based Discovery Signal design	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142066	Discussion on options for small cell discovery signals	Fujitsu	
R1-142137	DRS design details and considerations	LG Electronics	
R1-142200	On the design of the discovery signal	Sharp	
R1-142209	Detailed design of Discovery signal(s)	ETRI	
R1-142224	Detailed design of DRS	ZTE	
R1-142249	Discussion on discovery signal candidates	Hitachi Ltd.	
R1-142259	Views on detailed design of discovery signal for Rel-12 discovery procedure	NTT DOCOMO	
R1-142278	Discovery signal design	Broadcom Corporation	
R1-142286	Design of discovery signal for small cells	FiberHome	
R1-142300	Discovery signal designs for small cell discovery enhancements	MediaTek Inc.	
R1-142311	Details of discovery signal design	NVIDIA	
R1-142356	UE measurement based on discover signal	ASUSTeK	
R1-142367	Views on the design of DRS	CATR	

R1-142386	Design of discovery signals and procedures	Ericsson	
R1-142477	Discussion on small cell discovery signal design	CHTTL	

6.2.3.2.4 Discovery signal-based RRM measurement procedures

Mr Chair's recommendation: Focus on the RRM measurement procedures including network assistance information and the gap configuration(s)

R1-142687	WF on configuration for discovery procedure	LG Electronics, Fujitsu, NTT DOCOMO, Sony, ZTE	

The document was presented by Ms Yunjung Yi from LGE.

- A UE can be configured with one DRS measurement timing configuration (DMTC) per frequency
  - The reference timing for the offset is the primary cell's timing.
- For the period and offset in DMTC, candidate values
  - for the period "M", candidate values are [20, 40, 80, 160]
  - for the offset "L", candidate values are [0, 1, ..., M-1]
- In addition to period and offset, UE is informed following per frequency by RRC.
  - measurement bandwidth
    - The UE can assume the indicated measurement bandwidth is the same as the system bandwidth.
  - measurement window "N"
    - FFS exact range, e.g., {1, 2, …, 5ms}, and possible default value
  - FFS on DRS antenna port definition including the number of ports
  - FFS on additional network assistance which can further reduce UE complexity/power consumption
- A UE can be configured with one measurement gap if needed
- Note different UE configurations/assumptions may be informed to the UE for other purposes, e.g., for tracking/feedback, than RRM measurement.

Discussion: Qualcomm→ measurement bandwidth should be for discussion
Decision: The document is noted.

Agreement:

- A UE can be configured with one DRS measurement timing configuration (DMTC) per frequency
  - The reference timing for the offset is the primary serving cell's timing

Agreement:

- No new measurement gap pattern is introduced for DRS-based measurement

Not treated.

R1-141917	RRM measurement procedures with DRS	Huawei, HiSilicon	
R1-141959	Discovery signal-based RRM measurement procedures	Qualcomm Inc.	
R1-142029	RRM measurement for small cell discovery signal	Intel Corporation	
R1-142044	CRS-based Discovery Signal RRM measurement procedure	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142067	RRM Measurements for small cell on/off	Fujitsu	
R1-142097	Discovery signal-based RRM measurement procedures	Samsung	
R1-142138	DRS-based measurements with network assistance	LG Electronics	
R1-142168	Views on DRS measurement timing configuration	NEC	
R1-142184	Discovery signal based RRM measurement procedures	Panasonic	
R1-142225	On DS measurement configuration	ZTE	
R1-142260	Views on discovery signal-based RRM measurement procedures	NTT DOCOMO	
R1-142334	Timing information for energy-efficient small cell discovery and measurements	Huawei, HiSilicon	
R1-142387	Discovery signals and small cell on/off	Ericsson	
R1-142388	On network assistance and gap information	Ericsson	
R1-142442	RRM-measurement and related procedures for small cell on/off and discovery	NSN, Nokia	
R1-142474	Discussion on RRM measurement procedures in small cell on/off operation	Sony	
R1-142500	Measurement Gaps for Small cell on/off	Motorola Mobility	

6.2.3.2.5 Discovery signal-based RSRQ-like measurement

Definition of RSSI measurement with on/off operation of small cells

Friday 23rd

R1-142744	WF on DRS RSSI and RSRQ	Huawei, HiSilicon, NTT DOCOMO, Sharp, Broadcom, Samsung, Hitachi	(R1-142731)

The document was presented by David Mazzarese from Huawei.

- A single RSSI definition is introduced in Rel-12 for DRS-based RSRQ
  - Discovery RSSI (DRSSI) is measured on OFDM symbols that cannot contain signals potentially present in a DRS occasion, independently of whether the UE is configured to report CSI-RS-based RRM measurements
  - The same DRSSI measurement can be used to derive CRS-based RSRQ and CSI-RS-based RSRQ
- RSRQ = N*RSRP/(N*RSRP+DRSSI) for DRS-based measurements
  - N is the number of RBs of the DRSSI measurement bandwidth
  - The measurements in the numerator and denominator shall be made over the same set of resource blocks.

Decision: The document is noted and modified as follows:

Possible agreements:

- A single RSSI definition is introduced in Rel-12 for DRS-based RSRQ
  - Discovery RSSI (DRSSI) is measured on configured subframe(s) on OFDM symbols that cannot contain signals potentially present in a DRS occasion, independently of whether the UE is configured to report CSI-RS-based RRM measurements
  - The same DRSSI measurement can be used to derive CRS-based RSRQ and CSI-RS-based RSRQ
- RSRQ = N*RSRP/(N*RSRP+DRSSI) for DRS-based measurements
  - N is the number of RBs of the DRSSI measurement bandwidth
  - The measurements in the numerator and denominator shall be made over the same set of resource blocks

Continue offline discussion within today – (Huawei)
Finally left for email approval until 17th June – (Huawei)

Not treated.

R1-141936	RSSI measurements for small cell on/off operation	Huawei, HiSilicon	
R1-141960	Discovery signal-based RSRQ-like measurement	Qualcomm Inc.	
R1-141993	RSRQ measurement based on discovery signal	CATT	
R1-142045	CRS-based Discovery Signal RSRQ-like measurement	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142068	Discussion on RSRQ measurement for small cell on/off	Fujitsu	
R1-142098	Discovery signal-based RSRQ-like measurement	Samsung	
R1-142139	Considerations on DRS-based RSRQ measurement	LG Electronics	
R1-142185	Discussion on RSSI on RSRQ-like measurements	Panasonic	
R1-142226	On DS based RSRQ-like measurement	ZTE	
R1-142261	Views on discovery signal-based RSRQ measurement	NTT DOCOMO	
R1-142279	RSRQ calculation for small cell On/Off	Broadcom Corporation	
R1-142285	Discussion on RSSI definition for DRS based RRM measurement	FiberHome	
R1-142301	On discovery signal based RRM measurements	MediaTek Inc.	
R1-142302	Analysis and evaluation of discovery signal based RSRQ measurement definitions	MediaTek Inc.	
R1-142346	RSSI measurements with small cell on/off operation	InterDigital	
R1-142389	RSSI measurements for discovery signals	Ericsson	
R1-142413	Discussion on the DS-based RRM measurement	Coolpad	

6.2.3.3 Radio-interface based synchronization

Solutions for network listening in single-carrier or multi-carrier operation, to support multiple stratum level beyond 3 hops, e.g. 4 to 6 hops. Specify listening RS(s) including RS pattern (PRS and/or CRS), subframe periodicity, and offset, for both FDD and TDD. The potential standard impact to support network listening between the cells of different operators operating in the same TDD band. The potential standard impact to support subframe-level muting.
Note: Complete RAN1 part of radio interface based synchronization in Q2-2014

R1-141937	Evaluation of listening RS patterns	Huawei, HiSilicon	

Decision: The document is noted.

R1-141938	Discussion on listening RS design	Huawei, HiSilicon	

Decision: The document is noted.

R1-141961	Network synchronization by network listening	Qualcomm Inc.	

Decision: The document is noted.

R1-141994	Remaining details of RIBS for small cell	CATT	

Decision: The document is noted.

R1-142046	System analysis of Radio Interface Based Synchronization (RIBS)	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted.

R1-142099	RIBS solutions and potential standards impact	Samsung	

Decision: The document is noted.

R1-142140	Further discussion on network listening for intra-operator scenarios	LG Electronics	

Decision: The document is noted.

R1-142223	Designing issues of Radio-interface based Synchronization	ZTE	

Decision: The document is noted.

R1-142244	Radio-interface based synchronization for small cells	ITRI	

Decision: The document is noted.

R1-142250	Listening RS for RIBS	Hitachi Ltd.	

Decision: The document is noted.

R1-142364	Considerations on radio-interface based synchronization	CATR	

Decision: The document is noted.

R1-142390	On radio-interface based small cell synchronization	Ericsson	

Decision: The document is noted.

R1-142444	RIBS with Synchronization Accuracy Indication	NSN, Nokia	

Decision: The document is noted.

R1-142508	Listening RS design for radio interface based small cell synchronization	CMCC	

Decision: The document is noted.

R1-142509	RIBS for inter-operator scenario	CMCC	

Decision: The document is noted.

Agreements:

- For network listening, the following RS pattern is supported by configuration
  - CRS only
    - The number of CRS ports can be 1 or 2
  - CRS and PRS
    - The number of CRS ports can be 1 or 2
- The following periodicities and offset(s) are supported for network listening RS
  - A range of values (>=2) for the periodicity
    - Further offline discussion to choose all or a subset from [640ms, 1280ms, 2560ms, 5120ms, 10240ms, 20480ms]
  - Values of offset(s) FFS – Elean (Huawei)
- The max number of hops is kept at 3.

Thursday 22nd

R1-142716	Proposals on Radio Interface based synchronization	Huawei, HiSilicon	

The document was presented by Ms Elean Fan from Huawei.

- The listening RS instance shall satisfy

$$\left(10 \times n_f + \lfloor n_s / 2 \rfloor - \Delta_{LRS}\right) \bmod T_{LRS} = 0$$

- The range of values for periodicities T_{LRS}
  - [5120ms, 10240ms]
  - FFS on other values
- Listening RS subframe offsets Δ_{LRS} :
  - [1, T_{LRS}/4+1, 2 T_{LRS}/4+1, 3 T_{LRS}/4+1]

Discussion: Also supported by CMCC, CATR
Decision: The document is noted.

Alt. 1: Possible conclusion

- Send LS to RAN3 to tell RAN1 agreements

- Agreed followings
  - A range of values (>=2) for the periodicity
    - [640ms, 1280ms, 2560ms, 5120ms, 10240ms]
  - Values of offset(s)
    - 0 to N-1 (N: length of period)

Supported by Ericsson, NSN, LGE, ALU, ASB, ZTE, Qualcomm
Objected by Huawei, HiSilicon, CMCC

Alt. 2: Possible conclusion

- Agreed R1-142716
  - Send LS to RAN3 to tell RAN1 agreements, and RS pattern should be discussed in RAN1 within this week
  - Ask RAN3 to extend the S1/X2 signaling by including listening RS pattern and listening RS configuration. Listening RS configuration is used to indicate the listening RS transmission instances, which are also the instances to perform subframe-level muting
  - Ask RAN3 to further discuss the possibility for operators to configure the listening RS pattern, periodicity, offsets, and sub-frame level muting

Supported by Huawei, HiSilicon, CMCC, CATR, Qualcomm (if values can be changed)
Objected by ALU, ASB, Ericsson, NSN

Continue offline discussion until Friday morning and send LS to RAN3 in this week – Elean (Huawei)

Friday 23rd

R1-142754	Draft LS on radio interface based synchronization	Huawei, HiSilicon, CMCC, CATT, ZTE, IAESI	

The document was presented by Ms Elean Fan from Huawei.
Discussion: Qualcomm → values of offset(s) are FFS
Decision: The document is noted and final LS, including Qualcomm's comment, is agreed in R1-142762.

Not treated.

R1-141939	Discussion on network listening with eIMTA	Huawei, HiSilicon	
R1-141940	Discussion on network listening for intra/inter-operator deployment	Huawei, HiSilicon	
R1-142176	Discussions on network listening for inter-operator scenarios	LG Electronics	
R1-142443	Remaining design issues of RIBS	NSN, Nokia	

6.2.4 Physical layer functionalities required for operation of Dual Connectivity

WID in RP-132069.
Mr Chair's recommendation: UL simultaneous transmission and its related TPC aspects will mainly be discussed. Other remaining issues may be discussed, e.g., soft-buffer handling, common search space in SCG serving cell(s), etc.

R1-142263	Summary of email discussion [76b-08]	NTT DOCOMO	

The document was presented by Hiroki Harada from NTT DOCOMO.
Decision: The document is noted.

Questions raised by Panasonic over the email reflector:

Q1. Whether power split between CG is per CG or per information type and channel type at least in power limited case?
Note: PRACH/SRS could be discussed separately.

Alt.1: per CG
Supported by InterDigital, Broadcom, NTT DOCOMO, Panasonic, NSN, Nokia, ALU, ASB, Qualcomm, Sharp, Ericsson, Microsoft

Alt.2: per information type and channel type
Supported by Huawei, HiSilicon, BlackBerry, ASUSTeK, Intel, LGE, HTC, Fujitsu, NEC, ZTE, Qualcomm, Samsung

Q2. Whether the operation to reserve some power to other CG are allowed or not when UE reaches maximum power at synchronized case?
Extreme case question would be, when the required transmit power for MeNB PUCCH is more than 100%, whether it is allowed to transmit something in SeNB or not.

Alt. 1: Yes
Supported by Panasonic, Ericsson, NTT DOCOMO, Samsung, Fujitsu, ALU, ASB, Interdigital, Microsoft, Qualcomm, NSN, Nokia, Intel, BlackBerry
Alt. 2: No
Supported by Sharp, LGE, CATT, NEC, Huawei, HiSilicon, ZTE

Possible agreement:
- Operation to guarantee some power to CG is allowed when UE reaches maximum power at synchronized case

Q3. Whether UE processing time is always sufficient or not in asynchronous case?
Alt.1: Always sufficient
Supported by Samsung, Huawei, HiSilicon, ALU, ASB, NEC, BlackBerry, LGE, HTC, ZTE
Alt.2: There is some situation not sufficient
Supported by Broadcom, Qualcomm, MediaTek, Ericsson, Panasonic

Possible agreement
- It cannot be assumed that processing time is always sufficient in asynchronous case

Supported by Ericsson, Intel, Panasonic, MediaTek, Qualcomm, NTT DOCOMO, CMCC, Broadcom, MotM, Nokia, NSN
- Look ahead can be assumed in asynchronous case

Proposed by LGE, Huawei, HiSilicon, CATT, NEC, ZTE, ALU, ASB, Samsung
- What condition is FFS
  - For example timing difference between MCG and SCG, TA value

Mr Chair: can the above be taken as working assumption?
Huawei: no consensus, cannot assume → how can such working assumption be confirmed?

Conclusion:
There is no consensus about UE processing time and power setting mechanism in asynchronous case in RAN1

Possible working assumption:
- It can not be assumed that UE processing time is always sufficient in asynchronous case
- It does not exclude look-ahead in asynchronous case
- What condition is FFS
  - For example, timing difference between MCG and SCG, TA value

Continue offline discussion until Wednesday – Suzuki (Panasonic)

R1-142589	WF on power sharing for dual connectivity	InterDigital, Ericsson, Nokia, Nokia Siemens Networks, NTT DoCoMo, Panasonic, Sharp	

The document was presented by Paul Marinier from InterDigital.
- One framework to cover both synchronized and unsynchronized cases
- Maximum total output power P_{cmax} is defined by RAN4

For a UE configured with Dual Connectivity, the following principles of power allocation between CGs should be applicable:
- At least for synchronous case, in any given subframe, UE can have up to Pcmax available power
  - Available to a single CG when there is no transmissions in the other CG
  - Dynamically share available power between CGs otherwise
  - FFS for asynchronous case
- The UE allocates power to different CGs using ”scaling by CG” principle
  - At least for the case of no PRACH and no SRS
  - First determining required power for each CG;
  - Based on actual grant/assignment and TPC commands, at least for synchronous case
    - FFS: Based on configured ”reserved” power for CG starting later in time for asynchronous case
  - If sum of required power of CGs exceeds Pcmax, then UE dynamically shares power between CGs;
  - If the required power for a CG exceeds the power allocated to the CG, apply R11 scaling rules on transmissions for that CG (independently of other CG);
  - Transmission power of an ongoing subframe is maintained
- How to dynamically share total available UE power between CGs is FFS
  - Whether or not P_MeNB, P_SeNB needs to be specified depends on selected method for dynamic power allocation between CGs

Discussion: Samsung → fourth main bullet is similar to Q2, the last main bullet is Q1 – may be focus should only be on third main bullet.
Decision: The document is noted.

Agreement:

- Maximum total output power P_{cmax} is defined by RAN4

The remaining parts of the WF in R1-142589 are for offline discussion until Wednesday – Paul (Interdigital)

Wedneday 21st

R1-142654	Report of offline discussion on dynamic power sharing	InterDigital	

The document was presented by Paul Marinier from InterDigital.
Decision: The document is noted.

R1-142675	WF on Power Control for Dual Connectivity	LG Electronics, NTT DOCOMO, Panasonic	

The document was presented by Ms Yunjung Yi from LGE.

- In both synchronous and asynchronous cases, at least for PUCCH/PUSCH
  - Minimum guaranteed power allocation P_SeNB and/or P_MeNB can be configured
    - P_SeNB >=0, P_MeNB >=0, P_SeNB+P_MeNB <= PCmax
  - The total power allocation per CG Palloc_xeNB can be determined by
    - (1) Power allocation up to P_SeNB and P_MeNB (i.e. Ppre_SeNB and Ppre_MeNB)
      - At first, UE needs to allocate power per each eNB up to P_SeNB or P_MeNB (if configured) respectively regardless of priority rule if transmission is scheduled
        - » Ppre_xeNB = min {power based on actual grant/assignment and TPC commands, P_xeNB}
    - (2) Plus allocation of remaining power
- In both synchronous and asynchronous cases:
  - If look-ahead is supported or in synchronous case
    - All the remaining power can be used
    - For the remaining power, priority is determined based on UCI type across CG for channels not satisfied by P_SeNB or P_MeNB
      - FFS on details
      - Giving higher priority to a CG is not precluded
  - If look-ahead is not assumed:
    - Reserve P_SeNB and/or P_MeNB towards each eNB if there is potential uplink transmission
      - If the UE knows it does not have transmission in the other CG in overlapped subframes based on at least semi-static information, UE does not reserve the power for that CG
    - For the remaining power, earlier transmission is higher priority
  - Confirm WA with clarification:
    - Power control changes are not allowed one carrier in the middle of subframe in asynchronous case in dual connectivity (i.e., Power of on-going transmission is not adjusted)
  - Within a CG, for the total power allocation, reuse Rel-11 relative priority and power scaling of different channel types
- PRACH to PCell has the highest priority;
- SRS (both towards MeNB and SeNB) have the lowest priority;
- RAN1 perspective, differentiation between PUSCH with SRB and PUSCH without SRB is not assumed

Decision: The document is noted, modified and agreed as follows:

Agreements

- In both synchronous and asynchronous cases, at least for PUCCH/PUSCH
  - Minimum guaranteed power allocation P_SeNB and/or P_MeNB can be configured
    - P_SeNB >=0, P_MeNB >=0
    - FFS: P_SeNB+P_MeNB <= PCmax
    - FFS: P_SeNB+P_MeNB <= 100%
  - The total power allocation per CG Palloc_xeNB can be determined by
    - (1) Power allocation up to P_SeNB and P_MeNB (i.e. Ppre_SeNB and Ppre_MeNB)
      - At first, UE needs to allocate power per each eNB up to P_SeNB or P_MeNB (if configured) respectively regardless of priority rule if transmission is scheduled
        - » Ppre_xeNB = min {power based on actual grant/assignment and TPC commands, P_xeNB}
    - (2) Plus allocation of remaining power

Agreements:

- In both synchronous and asynchronous cases:
  - If look-ahead is supported or in synchronous case
    - All the remaining power can be used

- For the remaining power, priority is determined based on UCI type across CG for channels not satisfied by P_SeNB or P_MeNB
  - FFS on details
  - Giving all the remaining power to a CG is not precluded
- If look-ahead is not assumed:
  - Reserve P_SeNB and/or P_MeNB towards each eNB if there is potential uplink transmission
    - If the UE knows it does not have transmission in the other CG in overlapped subframes based on at least semi-static information (e.g., TDD UL/DL config.), UE does not reserve the power for that CG
  - For the remaining power, earlier transmission is higher priority
- FFS on whether there will be two types of UE behavior (supporting look-ahead and not supporting look-ahead) or there will be only one type of UE behavior
- Confirm WA with clarification:
  - Power control changes are not allowed for one channel on one carrier in the middle of subframe in asynchronous case in dual connectivity (i.e., Power of on-going transmission is not adjusted)
- Within a CG, for the total power allocation, reuse Rel-11 relative priority and power scaling of different channel types

- PRACH to PCell has the highest priority;
- RAN1 perspective, differentiation between PUSCH with SRB and PUSCH without SRB is not assumed

For further progress, Mr Chair set-up the following email discussions:
Email discussion until 31st July focusing on (FFS on details) – Yunjung (LGE)
Email discussion until 31st July focusing on (FFS on whether there will be two types of UE behavior (supporting look-ahead and not supporting look-ahead) or there will be only one type of UE behavior) – Suzuki (Panasonic)
Email discussion until 31st July focusing on (FFS: P_SeNB+P_MeNB <= PCmax and FFS: P_SeNB+P_MeNB <= 100%) – Fred (NTT DOCOMO)
Email discussion until 31st July focusing on possible NW coordination on power – Sigen (ALU)

R1-142677	WF on DL-SCH Soft Channel Bits in Dual-Connectivity	Ericsson, ALU	

The document was presented by Yufei Blankenship from Ericsson.
RAN2 agreements

- For "Maximum number of DL-SCH transport block bits received within a TTI" and "Maximum number of UL-SCH transport block bits transmitted within a TTI" the MeNB splits these UE capability restrictions between itself and the SeNB.
- For all other capabilities (e.g. "**Total number of DL-SCH soft channel bits**", "maxNumberROHC-ContextSessions", "supportedMIMO-CapabilityUL-r10", "supportedMIMO-CapabilityDL-r10", "supportedBandCombination") the MeNB provides the MCG configuration and the complete UE capabilities to the SeNB. MeNB and SeNB comprehend the configuration of each other, and use the left-over capability according to each other's configuration and the UE maximum capabilities.

- For both rate matching and soft channel bits storage in dual connectivity, the mechanism defined for CA is reused.
- An LS is sent to RAN2
  - Clarify that "Total number of DL-SCH soft channel bits" should be removed from 2nd bullet of RAN2 agreement

Discussion: Also supported by NTT DOCOMO.
Decision: The document is noted and agreed. LS to RAN2 to be prepared in R1-142680.

R1-142680	[Draft] Reply LS on DL-SCH Soft Channel Bits in Dual-Connectivity	Ericsson	

The document was presented by Yufei Blankenship from Ericsson.
Discussion: ALU requested to clearly state RAN2's action.
Decision: The document is noted and final LS is agreed in R1-142686, with the following update:

With regard to the "Total number of DL-SCH soft channel bits", RAN1 has made the following agreement:

- For both rate matching and soft channel bits storage in dual connectivity, the mechanism defined for CA is reused.
- RAN1 understanding is that RAN2 should remove "Total number of DL-SCH soft channel bits" from 2nd bullet of RAN2 agreement

RAN1 is still discussing other parameters

R1-142678	WF on Maximum number of TB bits in a TTI in Dual-Connectivity	Ericsson, Samsung	

The document was presented by Yufei Blankenship from Ericsson.

- For "Maximum number of DL-SCH transport block bits received within a TTI" and "Maximum number of UL-SCH transport block bits transmitted within a TTI":

  - Alternative 1: the sum of the capabilities configured for MeNB and SeNB is allowed to exceed the parameter in *ue-Category* table
  - Alternative 2: the sum of the capabilities configured for MeNB and SeNB does not exceed the parameter in *ue-Category* table
- For "Maximum number of DL-SCH transport block bits received within a TTI" and "Maximum number of UL-SCH transport block bits transmitted within a TTI": the sum of the capabilities configured for MeNB and SeNB is allowed to exceed the parameter in *ue-Category* table (Alternative 1)
- For "supportedMIMO-CapabilityUL-r10", "supportedMIMO-CapabilityDL-r10": For both UL and DL, one number of MIMO layers is defined and applied to all component carriers (i.e., reuse CA definition)

Discussion: Few companies having concern with second bullet.
Decision: The document is noted.

Possible working assumption:
- For "Maximum number of DL-SCH transport block bits received within a TTI" and "Maximum number of UL-SCH transport block bits transmitted within a TTI": the sum of the capabilities configured for MeNB and SeNB is allowed to exceed the parameter in *ue-Category* table (Alternative 1 in R1-142678)
- For "supportedMIMO-CapabilityUL-r10", "supportedMIMO-CapabilityDL-r10": For both UL and DL, one number of MIMO layers is defined and applied to all component carriers (i.e., reuse CA definition)
- If UE capability is exceeded, handling is up to UE implementation

Email discussion until 16th June – Yufei (Ericsson)

R1-142676	WF on PHR for Dual Connectivity	NTT DOCOMO, Panasonic	

The document was presented by Fred Takeda from NTT DOCOMO.
- For the PHR of the activated cells belonging to another CG/eNB, virtual PH is reported
  - FFS: Actual PH is additionally reported

Decision: The document is noted. Continue offline discussion until Thursday.

Thursday 22nd

R1-142727	Summary of offline discussion on PHR for dual connectivity	NTT DOCOMO	

The document was presented by Fred Takeda from NTT DOCOMO.
Decision: The document is noted.

R1-142728	WF on PHR for Dual Connectivity	NTT DOCOMO, Panasonic	

The document was presented by Fred Takeda from NTT DOCOMO.
- For the PHR of the activated cells belonging to another CG/eNB,
  - Specification support configuration to report both virtual PH and actual PH
  - Relation between type 1 and type 2 and how to transmit them is up to RAN2
- RAN1 send an LS to RAN2 to take into account this

Decision: The document is noted, modified and agreed as follows:
Agreements:
- For the PHR of the activated cells belonging to another CG/eNB,
  - UE is configured using higher layer signaling to report one of the followings
    - Always virtual PH
    - Actual PH when there is a PUCCH/PUSCH transmission for a cell in the other CG, otherwise virtual PH

Email discussion until 17th June about RAN1 related issue for PHR for dual connectivity – Fred (NTT DOCOMO)

R1-142732	WF on PHR triggerer	Broadcom, InterDigital	

The document was presented by Helka-liina from Broadcom.
- PHR should be triggered when UE becomes power-limited due to independent scheduling decisions between MeNB and SeNB
  - RAN1 to define the exact condition

Discussion: Qualcomm→ RAN2 issue
Decision: The document is noted. To be included in email discussion.

Conclusion:
Prepare draft LS (R1-142730) to RAN2 and RAN4 to tell dual connectivity agreements until Friday morning – (NTT DOCOMO)
Friday 23rd

R1-142730	[DRAFT] LS on RAN1 agreements on Physical layer functionalities required for operation of Dual Connectivity in RAN1#77	NTT DOCOMO	

The document was presented by Fred Takeda from NTT DOCOMO.
Discussion: ALU wondered why RAN1 email discussions are all included in that LS → are they impacting other WGs? → NTT DOCOMO: some of them have no impacts

Debate whether to capture the following note in terminology:
Note: In RAN1, the term "look-ahead" is used to describe the following UE action in unsynchronized dual connectivity, where different UL.timings apply to transmissions to the two eNB/CGs
- *UE takes into account the power requirement of the other eNB/CG before allocating its available power for the first eNB/CG, where the first eNB/CG is the eNB/CG which is earlier in timing.*

Decision: The document is noted and final LS is agreed in R1-142755 with following update, and add RAN3 to "to"

~~Related to the above, RAN1 also agreed to have following email discussions after RAN1 #77.~~
- ~~Email discussion until 31st July focusing on (FFS on details)~~
- ~~Email discussion until 31st July focusing on (FFS on whether there will be two types of UE behavior (supporting look-ahead and not supporting look-ahead) or there will be only one type of UE behavior)~~
- ~~Email discussion until 31st July focusing on (FFS: P_SeNB+P_MeNB <= PCmax and FFS: P_SeNB+P_MeNB <= 100%)~~

~~Email discussion until 31st July focusing on possible NW coordination on power~~

RAN1 is still discussing issues that may have impact on other WGs including above FFS issues and possible NW coordination on power

Note: In RAN1, the term "look-ahead" is used to describe the ~~following~~ UE action in unsynchronized dual connectivity, where different UL.timings apply to transmissions to the two eNB/CGs
- UE takes into account the power requirement of the other eNB/CG before allocating its available power for the first eNB/CG, where the first eNB/CG is the eNB/CG which is earlier in timing.

R1-142679	WF on PUCH on Scell	Huawei, HiSilicon, NTT DOCOMO	

The document was presented by David Mazzarese from Huawei.
- Rel-12 CA supports PUCCH transmission on two serving cells:
  - Pcell for SCells in PUCCH cell group 1
  - One SCell configured to carry PUCCH for SCells in PUCCH cell group 2
  - One Scell can only belong to one PUCCH cell group
- PUCCH on SCell with CA is supported as follows:
  - No cross-carrier scheduling between cells in different PUCCH groups
  - PUCCH power control follows the solution of dual connectivity
  - PUCCH on SCell can carry HARQ-ACK feedback and CSI
    - Ask RAN2 whether SR is necessary on SCell
- Send an LS to RAN2 asking to define signalling for the configuration of two PUCCH cell groups where one cell group contains the PCell and the other cell group contains a SCell configured to carry PUCCH
- Introduce one UE capability bit to indicate support for PUCCH on PCell and SCell in CA, separately from the indication of the support of dual connectivity

Discussion: Qualcomm/Samsung → ongoing discussion still to be finalized before any formal LS
Decision: The document is noted. Continue offline discussion until Thursday.
Thursday 22nd : Huawei suggested to continue discussion until next meeting.
Friday 23rd

R1-142743	Way forward on PUCCH on Scell	Huawei, HiSilicon, NTT DOCOMO	(R1-142679)

The document was presented by David Mazzarese from Huawei.
- Rel-12 CA supports PUCCH transmission on two serving cells:
  - On the PCell for SCells in PUCCH cell group 1
  - On one SCell configured to carry PUCCH for SCells in PUCCH cell group 2
  - One SCell can only belong to one PUCCH cell group
- PUCCH on SCell with CA is supported as follows:
  - No cross-carrier scheduling between cells in different PUCCH groups
  - PUCCH power control follows the solution of dual connectivity
  - PUCCH on SCell can carry HARQ-ACK feedback and CSI
    - Ask RAN2 whether SR is necessary on SCell
- Send an LS to RAN2 asking
  - whether SR is necessary on Scell if the PUCCH is sent on Scell in carrier aggregation
  - to define signalling for the configuration of two PUCCH cell groups where one cell group contains the PCell and the other cell group contains a SCell configured to carry PUCCH
- Introduce one UE capability bit to indicate support for PUCCH on PCell and SCell in CA, separately from the indication of the support of dual connectivity

Discussion: Ericsson asked to leave it until next meeting.
Qualcomm: still some concern with power control that remains unclear for dual connectivity.
Decision: The document is noted, modified and agreed as follows:

Agreements:

- If PUCCH on Scell for CA is supported,
  - PUCCH transmission on two serving cells in CA is realized by following methods:
    - On the PCell for SCells in PUCCH cell group 1
    - On one SCell configured to carry PUCCH for SCells in PUCCH cell group 2
    - One SCell can only belong to one PUCCH cell group
    - One of the two serving cells is PCell
  - PUCCH on Scell only for CA is not supported in Rel-12
  - PUCCH on two serving cells in CA is not supported within MeNB or SeNB
  - PUCCH on SCell with CA is realized by following methods:
    - No cross-carrier scheduling between cells in different PUCCH groups
    - FFS: How PUCCH power control will be supported
    - PUCCH on SCell can carry HARQ-ACK feedback and CSI
      - Ask RAN2 whether SR is necessary on SCell
  - Whether new terminologies PUCCH cell group 1 and 2 are introduced or not is up to RAN2
  - FFS: Meaning of simultaneous PUCCH/PUSCH transmission capability bit introduced in Rel-10 will be not changed
- Send an LS to RAN2 asking
  - ask RAN2 to analyse the complexity if RAN1 supports PUCCH on Scell in above approaches and provide feedback to RAN1 on whether to support PUCCH on Scell for CA in Rel-12
    - whether SR is necessary on Scell if the PUCCH is sent on Scell in carrier aggregation
    - RAN1 ask RAN2 whether to consider introduction of one UE capability bit to indicate support for PUCCH on PCell and SCell in CA, separately from the indication of the support of dual connectivity

Email discussion until 12th June about above FFS issues – David (Huawei)

R1-142761	[DRAFT] LS on the support of PUCCH on two serving cells in CA	Huawei	R1-142769

Decision: The document is noted and final LS is agreed in R1-142769.

R1-142756	WF on TDD-FDD CA support in dual connectivity	Huawei, HiSilicon, LG Electronics, NTT DOCOMO	

The document was presented by David Mazzarese from Huawei.

- TDD/FDD CA is supported within MeNB and within SeNB

Decision: The document is noted and is agreed. Prepare draft LS (R1-142757) to RAN2 within today – David (Huawei)

R1-142757	[DRAFT] LS on the support of TDD/FDD CA in Dual Connectivity	Huawei	

The document was presented by … from … and
Discussion: Samsung questioned how this will impact RAN2 work.
Decision: The document is noted and final LS is agreed in R1-142768.

Not treated.

R1-141931	Power headroom report in dual connectivity	Huawei, Hisilicon	
R1-141962	Physical layer aspects of dual-connectivity	Qualcomm Inc.	
R1-141995	UL power control for dual connectivity	CATT	
R1-141996	UL power scaling for dual connectivity	CATT	
R1-141997	PDCCH common search space in SCG	CATT	
R1-142047	UL power control and power scaling for dual connectivity	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-142048	Common search space on SeNB for dual connectivity	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-142049	UE capability sharing between MeNB and SeNB for dual connectivity	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142069	Dynamic power allocation for power limited UE in dual-connectivity	Fujitsu	
R1-142100	Parallel random access preamble transmissions in dual connectivity	Samsung	

R1-142101	UL Power Control in Dual Connectivity	Samsung	
R1-142102	UE Capability for MCG and SCG	Samsung	
R1-142103	Prioritization of UL Transmissions under Power Limitation	Samsung	
R1-142141	Uplink power control for dual connectivity	LG Electronics	
R1-142142	Power headroom reporting for dual connectivity	LG Electronics	
R1-142143	Remaining RAN1 issues of dual connectivity	LG Electronics	
R1-142169	UL power allocation scheme in dual connectivity	NEC	
R1-142170	Channel prioritisation and power scaling for dual connectivity	NEC	
R1-142171	UL/DL processing capability of UE in Dual Connectivity	NEC	
R1-142186	TPC on dual connectivity	Panasonic	
R1-142201	UL power control for dual connectivity	Sharp	
R1-142210	Uplink power control in dual connectivity	ETRI	
R1-142214	Parallel random access preamble transmissions in dual connectivity	ZTE	
R1-142215	UCI feedback mechanism for dual connectivity	ZTE	
R1-142216	Physical layer aspects of dual connectivity	ZTE	
R1-142251	PDCCH common search space on SeNB	Hitachi Ltd.	
R1-142262	Open issues on dual connectivity	NTT DOCOMO	
R1-142264	Power-control mechanisms for dual connectivity	NTT DOCOMO	
R1-142265	RAN1 specification impact of PUCCH on SCell for CA	NTT DOCOMO	
R1-142266	Views on remaining open issues on dual connectivity	NTT DOCOMO	
R1-142280	Uplink Power Control for Dual Connectivity	Broadcom Corporation	
R1-142281	Power Headroom Reporting to Support UL Power Control in Dual Connectivity	Broadcom Corporation	
R1-142287	Discussion on Dynamic Power-sharing of DC UL transmission	FiberHome	
R1-142290	UL Dynamic Power-Sharing in Dual Connectivity	HTC	
R1-142291	UL Power Control in Unsynchronized Dual Connectivity	HTC	
R1-142335	Discussion on the UE processing capabilities in dual connectivity	Huawei, Hisilicon	
R1-142336	Discussion on the Transmission power control in dual connectivity	Huawei, Hisilicon	
R1-142337	Extending PUCCH on PCell and pSCell to Carrier Aggregation	Huawei, HiSilicon	
R1-142347	Power sharing in dual connectivity	InterDigital	
R1-142348	Power headroom reporting in dual connectivity	InterDigital	
R1-142355	UL Transmit Power Control for Dual Connectivity	BlackBerry UK Limited	
R1-142357	UL Power Control for Simultaneous UCI Transmission	ASUSTeK	
R1-142369	UL Power transmission for dual connectivity	China Telecom	
R1-142391	UE Capability Handling in Dual Connectivity	Ericsson	
R1-142392	Further Discussion on UL Power Control in Dual Connectivity	Ericsson	
R1-142394	Simultaneous Rx/Tx support for dual connectivity	Ericsson	
R1-142395	Initialization of TA values	Ericsson	
R1-142445	Uplink Power Control for Dual Connectivity	NSN, Nokia	
R1-142446	Remaining RAN1 Issues of Dual Connectivity	NSN, Nokia	
R1-142492	Uplink Power Control for Dual Connectivity	KT Corp.	
R1-142493	Remaining issue on UCI transmission for Dual Connectivity	KT Corp.	
R1-142495	On UL Power Control for Dual Connectivity	Texas Instruments	
R1-142535	Considerations on UE capabilities in DuCo	Broadcom Corporation	
R1-142569	Discussion on physical layer aspects for support of dual connectivity	Intel Corporation	(R1-142030)
R1-142577	Power headroom reporting for dual connectivity	Ericsson	(R1-142393)

6.2.5 LTE Device to Device Proximity Services

WID in RP-140518.

Mr Chair's recommendations: Focus on device to device discovery in network coverage (intra-cell and inter-cell) and communication in network coverage (intra-cell and inter-cell), in partial network coverage and outside network coverage. The communication part is targeted to apply only to public safety use. The partial network coverage and out of network coverage

scenarios apply only to public safety use. The work will proceed from the starting point of the agreements and working assumptions reached during the study item as captured in TR 36.843.
No relaying, no standardized inter-cell coordination based on X2 or air interface, no out of network discovery in Release 12 and limited time to be spent on inter-frequency discovery.

R1-142721	Summary of Ad-hoc session on Study on LTE Device to Device Proximity Services	Ad-Hoc Chairman (Alcatel Lucent)	

The document was presented by Matthew Baker from ALU and provides the outcomes of D2D session.
Decision: The document is endorsed and incorporated below, including some changes brought up on Friday afternoon.

6.2.5.1 D2D physical signals and channels

6.2.5.1.1 D2D physical channel design discovery and broadcast communication based on PUSCH structure

R1-142575	Summary of Email discussion [76b-09] D2D signal gap	LG Electronics	

Decision: The document is noted.
Proposal:
Alt 1 (as per 2575): QC, GDB, LGE, CATT, ETRI, HW, HiSi, Intel
Alt 2 (as below): Sharp, ZTE, ALU, ASB, Microsoft, Fujitsu, E///, Samsung, Broadcom, Nokia, NSN, IDC

Agreement:
- For all UEs, 1-symbol gap is used in every D2D transmission subframe.
  - UE drops the entire D2D transmission in subframe n if a D2D transmission without TA is scheduled in subframe n and a transmission with TA>1 symbol is scheduled in subframe n+1.
    - FFS whether any special consideration is needed for "a transmission with TA > 1 symbol" when the WAN UL transmission is on a different carrier.

R1-141965	Link level simulation results for D2D broadcast communication	Qualcomm Inc.	

Decision: The document is noted.

R1-141998	Data transmission in D2D communication	CATT	

Decision: The document is noted.

R1-142398	D2D Physical Channels Design	Ericsson	

Decision: The document is noted.

Agreement:
- Inter-subframe frequency hopping is supported for D2D data communication, and for discovery and SA transmission if multiple subframe transmission is used
  - Details FFS, including:
    - FFS whether the hopping is PUCCH-like or PUSCH-like or something else.
    - FFS: Whether or not frequency hopping is used, e.g:
      - configurable for Mode 1
      - preconfigured for Mode 2
    - FFS details of hopping parameters and how they are (pre-)configured
- Intra-subframe frequency hopping is not supported (neither for data communication nor for discovery nor for SA transmission)

R1-141963	Reference signal design for D2D	Qualcomm Inc.	

Decision: The document is noted.

R1-141999	Details of D2D signal design	CATT	

Decision: The document is noted.

R1-142397	On Scrambling of D2D Physical Channels	Ericsson	

Decision: The document is noted.

Agreement:
- For D2D discovery, the scrambling of D2D discovery messages, the DMRS base sequence and the DMRS CS are fixed in the specifications: 510 for message scrambling and DMRS base sequence, CS = 0, Delta_Shift = 0, sequence hopping disabled

R1-142650	WF on D2D Signal Design	Qualcomm Incorporated, Kyocera, ZTE, General Dynamics	

Decision: The document is noted.

Agreement:
- PUSCH DMRS are used for SA, Data and Discovery without frequency hopping across slots
  - 2 RS signals on Symbols with *l*=3 and for normal CP, *l*=2 for extended CP
  - FFS: remaining aspects of base sequence, cyclic shift and OCC
- PUSCH RE mapping is used for SA, Data and Discovery if D2DSS is not transmitted, at least by the same UE, on the same sub-frame
  - FFS if it possible that the transmitting UE knows D2DSS is configured to be transmitted by another UE in the same subframe.

Working assumption:
- For SA, the DMRS base sequence and the DMRS CS are fixed in the specifications: 510 for message scrambling and DMRS base sequence, CS = 0, Delta_Shift = 0, sequence hopping disabled

Agreement:
- The DMRS base sequence and CS and OCC for D2D communication is derived from the ID in the SA

R1-142104	CP configuration for out-of-coverage	Samsung	

Decision: The document is noted.

Working assumption:
- For out-of-coverage UEs that do not use D2DSS from D2DSSue_net as the synchronisation reference for D2D transmission, CP length for D2DSS and PD2DSCH is preconfigured
  - FFS whether out-of-coverage UEs are expected to blind detect CP length of other UEs, or whether they are only expected to receive D2DSS and PD2DSCH from UEs with the same CP length as they are themselves (pre-)configured with for D2DSS and PD2DSCH.
    - Revisit after agreeing details of D2DSS transmission timing.

Work on a WF offline for the other aspects of out-of-coverage CP length by Thursday – Shailesh - R1-142656.

Agreement:
- D2DSS and PD2DSCH have equal CP length
- UEs assume that the same length CP of all D2D signals/channels (at least for a given mode/type, depending on the FFSs below) is configured by the network or pre-configured for D2DSS transmitted by a UE for both in coverage and out of coverage cases
  - If the network-configured and pre-configured CP lengths are different, the network-configured CP length is used.
  - FFS whether CPs for Mode 1 and Mode 2 may be different for D2D data channel.
  - FFS whether CPs for Type 1 and Type 2 discovery may be different
- Reception of D2DSS transmitted by a UE does not require blind detection of CP length

Background – initial discussion of other cases:
- For out-of-coverage UEs that use PD2DSS from an in-coverage UE as the synchronisation reference for D2D transmission, CP length of all D2D transmissions is
  - derived from D2DSS
    - Samsung
  - derived from PD2DSCH
    - LGE, CATT
  - pre-configured
    - Broadcom
  - fixed in the specifications to use the extended CP
    - Broadcom
- For out-of-coverage UEs that do not use PD2DSS from an in-coverage UE as the synchronisation reference for D2D transmission, CP length of all D2D transmissions is
  - pre-configured
    - Broadcom, CATT, NEC
  - fixed in the specifications to use the extended CP
    - Broadcom, CATT, Samsung, NEC

Agreement:
- For in coverage UEs, with the possible exception of Type 2B discovery, D2DSS and PD2DSCH use downlink timing
  - FFS for type 2B discovery

R1-142177	Summary of Email Discussion for Discovery Preamble for D2D	ITRI	

Decision: The document is noted.

Agreement:
- A preamble is not needed for discovery or communication
- A D2DSS can be used for timing and frequency synchronization

Not treated.

R1-141921	D2D discovery signal design	Huawei, HiSilicon	
R1-141922	D2D communication data channel design	Huawei, HiSilicon	
R1-141964	Link level simulation results for D2D discovery	Qualcomm Inc.	
R1-142031	Remaining details of D2D physical channel design	Intel Corporation	
R1-142051	Channel design for D2D discovery	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-142052	Preamble design for D2D Discovery	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-142105	Details on scrambling sequence generation	Samsung	
R1-142144	Discussion on D2D Communication Physical Layer Design	LG Electronics	
R1-142145	Discussion on D2D Discovery Physical Layer Design	LG Electronics	
R1-142202	Consideration on Configurable CP Length for D2D Transmission	Sharp	
R1-142203	Use a UE-specific RNTI with a D2D grant	Sharp	
R1-142211	DMRS Structure for Reducing UE Power Consumption	ETRI	
R1-142227	On physical channel design for D2D discovery	ZTE	
R1-142228	SA design for D2D communication	ZTE	
R1-142338	Gap for D2D transmissions	Huawei, HiSilicon	
R1-142396	On Timing and D2D Signals Multiplexing	Ericsson	
R1-142427	Issues in D2D Signal Design	Microsoft Corporation	
R1-142478	Remaining issues on D2D physical channel design	Kyocera	
R1-142479	Physical resource design for D2D discovery	Kyocera	
R1-142643	WF on DMRS cyclic shift for Type 1 discovery	LG Electronics, Qualcomm, ZTE	
R1-142656	Offline Discussion on D2D CP Length	Qualcomm Incorporated (Rapporteur)	

6.2.5.1.2 Control needed for broadcast communication transmission/reception

R1-142106	Control information needed for D2D broadcast communication	Samsung	

Decision: The document is noted.

R1-142592	Scheduling assignment content for D2D	Huawei, HiSilicon	(R1-141927)

Decision: The document is noted.

R1-142050	Design of Scheduling Assignment	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

Decision: The document is noted.

R1-142428	SA content for D2D broadcast communication	Microsoft Corporation	

Decision: The document is noted.

R1-142480	Design details of scheduling assignments	Kyocera	

Decision: The document is noted.

R1-141966	Control for D2D broadcast communication	Qualcomm Inc.	

Decision: The document is noted.

R1-142107	Identifier in scheduling assignment for D2D communication	Samsung	

Decision: The document is noted.

R1-142400	On scheduling assignments	Ericsson	

Decision: The document is noted.

R1-142653	WF on SA content and design	Qualcomm Incorporated, General Dynamics, III	

Decision: The document is noted.
Proposal:

- SA contains the following explicit signaling
  - Timing advance of Data
  - RPT information, including:
    - Bandwidth of Data
    - Frequency resource of Data
    - Frequency hopping of Data
    - time domain resource information for transmission of multiple MAC PDUs
    - Not precluding resource randomization based on RPT
  - 16 bit CRC scrambled using L2 provided ID
- SA uses Rel-8 TBCC
- Resource for single transmission of SA is FFS between 1 PRB-pair and 2 PRB-pair
  - Retransmissions of SA is supported
  - Time and frequency pattern is fixed in specification

R1-142649	WF on resource allocation for SA and D2D data	LG Electronics, Ericsson, ZTE, Kyocera	

Decision: The document is noted.
Proposal:

- In broadcast data transmission, the frequency position of resource assigned for D2D data is derived from the frequency position of resource used for the first SA transmission within the SA cycle
  - FFS whether the same start position of RB is used for both D2D data and the first SA transmission

Indication of frequency position of data resource:

- Alt1: explicitly signalled in SA
  - Intel, QC, MS, Sharp, GDB, Fujitsu, HW, HiSi, NSN, Nokia, Coolpad, NEC, III, IDC,
- Alt2: derived from the frequency position of resource used for the first SA transmission within the SA cycle
  - LGE, ZTE, E///, Kyocera, Samsung,

Working assumption:

- Frequency position of data resource is explicitly signalled in SA
  - Can be revisited after agreeing other content of SA if it turns out that "too many" retransmissions are required for the SA and/or design of SA and/or associated DCI is not feasible, or if data resource collision turns out to be a significant problem.

Number of bits for D2D reception timing adjustment in SA (at least for Mode1):

- 11: MS, E///, Nokia, NSN
- 5 (ish): QC, E///, GDB, Nokia, NSN
- 3: ALU, ASB, Nokia, E///, NEC, QC, GDB, NSN,
- 0 (D2D reception timing adjustment is broadcast in a SIB, or sent on PD2DSCH): Sharp, HW, HiSi, Samsung, Fujitsu, LGE, Kyocera, ALU, ASB, ZTE

Agreement:

- 6 bits are used to indicate D2D reception timing adjustment in SA (at least for Mode1), giving values of TA spaced at intervals corresponding to the extended CP length with a cell radius of 100km.

Work offline until Thursday afternoon (Saurabha - R1-142657) on a proposal for signalling time domain RPT info in SA and how many bits are needed.
Working assumption at least for the purpose of estimating the number of bits as above:

- Number of blind transmissions (including first transmission) for D2D data:
  - At least the value 4 is supported
  - FFS whether other values such as {1, 2, 8} are also needed.

Thursday 22nd

R1-142657	Offline discussion summary on RPT	Qualcomm Incorporated (Rapporteur)	

Decision: The document is noted.

Agreement:

- The same time resource pattern of transmission (T-RPT) is used for each MAC PDU on a per-UE basis

Working assumption:

- FFS whether a transmitting UE uses all the transmission opportunities given by the T-RPT in the SA
- T-RPT in the SA indicates:
  - Transmission interval(s) between transmission of multiple MAC PDUs
  - Number of transmissions of a given MAC PDU (if more than one value is possible)
  - Resources for transmission of each MAC PDU
- T-RPT has no more than 256 values
- Time indices (parameters within T-RPT) are defined only for the sub-frames included in the resource pool for Mode 2 and Mode 1 (if a resource pool is defined) and available sub-frames for TDD carriers
- FFS whether (and if so how) the frequency resource might be jointly signalled with time domain info
- FFS whether the interpretation of the bits is UE-specific or common

At RAN1#78, consider details of the T-RPT.

Agreement:

- SA uses Rel-8 TBCC

Agreement:

- For both Mode 1 and Mode 2, resource for single transmission (i.e. 1 subframe) of SA is FFS between 1 PRB-pair and 2 PRB-pair
  - Retransmissions of SA are supported
    - FFS whether Chase combining
  - Total number of transmissions of SA is FFS between
    - fixed to a single value in specifications, and
    - (pre-)configurable among two values
    - FFS until RAN1#78 what these values are
  - Number(s) of SA subframes in the SA resource pool FFS until RAN1#78
- Given a certain SA resource pool and time/frequency resource that is used for a transmission of an SA message by a UE, the other time/frequency resources used by the same UE for transmission(s) of the same SA message within an SA resource period are known and fixed in the specification
  - Details FFS
  - FFS on whether/how to minimize the collision of transmissions in Mode 2

Offline discussion to clarify the agreement from the above starting point – revisit on Thursday afternoon – Shailesh - R1-142658 (outcome included above).

Thursday 22nd

R1-142658	Offline Discussion on SA Transmission	Qualcomm Incorporated (Rapporteur)	

Decision: The document is noted.

Agreement:

- Explicit NDI is not needed

RV for data:

Decide at RAN1#78 between:

- Alt 1: implicitly determined from data resource allocation
- Alt 2: 1 bit is provided in SA to configure between Chase combining or a fixed RV pattern

Friday 23rd

R1-142738	WF on TA in SA	LG Electronics, Ericsson, ALU, ASB, US DoC, Intel, Huawei, HiSilicon, Nokia, NSN, Fujitsu, Samsung, ZTE, General Dynamics, CATT, Broadcom, NEC, Panasonic	

Discussion: This is a way backward → better inviting companies to come with such proposal at next meeting
LGE: why wait until next meeting?
Decision: The document is noted and is for email discussion until RAN1 #78 meeting – (LGE)

Not treated.

R1-141920	Scheduling assignment design for D2D	Huawei, HiSilicon	

R1-141930	Timing signaling for D2D communication	Huawei, HiSilicon	
R1-142000	Control signaling in SA	CATT	
R1-142053	System Control and Security for D2D broadcast communication	Alcatel-Lucent, Alcatel-Lucent Shanhai Bell	
R1-142054	Support of Lawful Intercept of D2D broadcast communication	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142070	Control signaling for D2D broadcast	Fujitsu	
R1-142146	Control design for D2D broadcast communication	LG Electronics	
R1-142147	Discussion on signaling for D2D communication resource allocation	LG Electronics	
R1-142204	CRC scrambling for Scheduling assignment	Sharp	
R1-142318	Discussion on D2D Control Channel	Intel Corporation	
R1-142350	On control signaling and scheduling assignments for D2D	InterDigital	
R1-142399	Transmission resource allocation control for D2D communication	Ericsson	
R1-142401	D2D Broadcast Control Information and Related Procedures	Ericsson	
R1-142447	Scheduling assignment and related data transmissions	Nokia, NSN	

6.2.5.1.3 Other

R1-142642	WF on D2D power control for communication Mode 1	LG Electronics, Qualcomm, Panasonic, Kyocera	

The document was presented by Hyukjin Chae from LGE.

- For communication Mode 1, the current PUSCH UL PC should be reused.
  - Values of P0 and alpha for mode 1 D2D communication are configured by eNB.
    - P0 and alpha for D2D can be different from P0 and alpha for WAN
  - eNB-UE path loss is used not UE-UE path loss.
  - 2 bits TPC command is conveyed in D2D grant.
  - FFS whether separate TPC between SA and data.

Decision: The document is noted, modified and agreed as follows:

Agreements:

- For communication Mode 1, the current PUSCH UL PC is baseline
  - Values of P0 and alpha for Mode 1 D2D communication are configured by eNB.
    - P0 and alpha for D2D can be different from P0 and alpha for WAN
  - eNB-UE path loss is used not UE-UE path loss.
  - X bits TPC command is conveyed in D2D grant.
    - FFS: X bits (X > 0)
  - FFS whether power control parameters are the same between SA and data
  - FFS whether accumulate PC or absolute PC
  - FFS boosting range is different from cellular
  - Maximum power transmission is not precluded

Not treated.

R1-141928	Power control for D2D signals	Huawei, HiSilicon	

6.2.5.2 D2D resource allocation mechanisms

Not treated.

R1-142071	Discussion of RRM measurement for D2D communication	Fujitsu	
R1-142077	RPT design for broadcast communication	CATT	
R1-142402	On resource allocation for communication in Mode 1 and Mode 2	Ericsson	
R1-142403	Discovery Resource Allocation	Ericsson	
R1-142408	Frame Structure for D2D-Enabled LTE Carriers	Ericsson	

6.2.5.2.1 Distributed resource allocation

Communication

R1-141929	Distributed resource allocation from mode-2	Huawei, HiSilicon	

The document was presented byPhilippe Sartori from Huawei and proposes:

- Proposal 1: Confirm the working assumption that for mode 2 a resource pool for scheduling assignment is pre-configured and/or semi-statically allocated.
- Proposal 2: Resource pool for data and control can be different. The reception pool and the transmission pool can also be differently pre-configured or semi-statically allocated.
- Proposal 3: At least two parameters need to be defined:
  - A period for sensing and resource selection within
  - The size of D2D communication resource unit
- Proposal 4: If UE has obtained some available resources in a period, it can transmit in the same resources in the following periods.

Decision: The document is noted.

R1-142055	Resource allocation for D2D Broadcast Communication	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

The document was presented by Fang Chen Cheng from ALU and proposes:

- Proposal 1: The resource pool for D2D communication is either pre-configured or configured by the LTE network. No explicit control information about the resource pool needs to be transmitted from a D2D UE.
- Proposal 2: To increase coverage, narrow band (as low as 2 or 3 PRBs) should be employed for D2D broadcast data channel.
- Proposal 3: 4 transmissions of a VoIP packet should be supported for the link level performance to satisfy the SINR requirement for -107dBm receiver reference sensitivity.
- Proposal 4: To resolve the half-duplex constraint and alleviate in-band emission, sub-frames used for transmissions from different broadcast UEs follow different predefined patterns which partially overlap.
- Proposal 5: RPT sets based on Walsh matrices should be used for RPT construction for broadcast UEs.

Decision: The document is noted.

R1-142358	Discussion of mode 2 resource allocation for D2D communication	ASUSTeK	

The document was presented by Joe Chang from ASUSTeK and concludes:

- Assumption 1: SA resource pool and data resource pool are separated.
- Assumption 2: the resource pool period, SA resource pool period and frequency of resource pool should be decided.
- Observation 1: the monitoring-based resource selection in mode 2 should be considered.
- Proposal 1: D2D transmitting UE transmit multiple SAs in one SA resource pool should be considered.

Decision: The document is noted.

Discovery

R1-142075	Resource Allocation for Type 1 D2D Discovery	Fujitsu	

The document was presented by … from Fujitsu and is summarized as follows:

- Proposal 1: Multiple transmission of a given discovery message within one discovery period should be supported.
- Proposal 2: The maximum number of repeated transmissions for one given discovery message within one discovery period should be limited and configured for a ProSe UE.
- Observation 1: It is possible that more than one discovery messages from the same UE may be triggered to be transmitted within one discovery period.
- Proposal 3: The maximum number of transmissions for all triggered discovery messages on one UE within one discovery period should be limited and configured for a ProSe UE.
- Observation 2: For optimizing discovery performance and improving resource utilization, the size of discovery resource pool need to be adjusted based on the load of discovery signal transmission.
- Proposal 4: The assistant information should be provided to the network side for configuring a suitable resource pool.

Decision: The document is noted.

R1-142149	Operation in Type 1 Resource Allocation for D2D discovery	LG Electronics	

The document was presented by … from LGE and is summarized as follows:

- Observation 1: An RRC_Idle UE consumes less power if it transmits discovery signal several times after wakes up from a long sleep state.
- Proposal 1: Multiple transmission opportunity should be allowed for each UE in a discovery resource period. Resources in each period can be partitioned into multiple groups, and the number of each UE's transmission within a discovery resource group can be limited to one.
- Observation 2: Time domain coordination can mitigate in-band emission impact on discovery performance.
- Proposal 2: To mitigate the in-band emission impact on discovery performance, UE grouping based discovery resource pool configuration should be supported. RSRP measurement can be used for UE grouping criterion.

- Proposal 3: For Type 1 discovery, the network configures the transmission probability in consideration of the target discovery range, the tradeoff between short-term and long-term discovery performance, and UE power consumption.
- Proposal 4: Contiguous retransmission in a discovery resource group is supported in Type 1 discovery.
- Observation 3: Open loop power control result in significant coverage different between cell center UE and cell edge UE.
- Proposal 5: For PUCCH region protection, following methods needs to be further studied.
  - Open loop power control in consideration of minimizing discovery coverage difference between cell edge UE and cell center UE
  - PUCCH transmission power boosting in discovery subframe
  - Frequency resource selection restriction
- Proposal 6: Discovery signal reception quality such as SINR and BLER and discovery resource utilization metric such as RSRP and RSRQ (RSSI) is reported by UEs.
- Proposal 7: The maximum number of decodable discovery signals in a subframe should be taken into account.
- Proposal 8: When a UE looses discovery signal transmission opportunity due to WAN transmission, further discussion whether network grants more transmission opportunity for other discovery resource to the UE or not is needed.

Discussion: Qualcomm raised concern about multiple wake-up procedure.
Decision: The document is noted.

R1-142362	Evaluation on D2D distributed resource allocation for discovery	CATR	

The document was presented by Ms Jiao Huiying from CATR and concludes that option 1 (based on Tx UE transmission period and offset) could get good performance at the several first discovery periods.
Decision: The document is noted.

WFs

R1-142634	WF on sensing for mode 2 communication	Huawei, HiSilicon, CATT, Panasonic, Potevio, ALU, ALU-Shanghai, Broadcom, Samsung, Fujitsu, LGE	

The document was presented by Hossein Bagheri from Huawei.

- For mode 2 communication: a UE's resource selection is based on sensing the channel for a period of time
  - Sensing scheme to be decided at RAN1#78

Discussion: Mr Chair noted that RAN1#77 should be the last meeting for decision.
Huawei → can the WF be considered as working assumption?
Decision: The document is noted. Continue offline discussion until Wednesday - Huawei
Revised in **R1-142729**

R1-142729	WF on Sensing for mode 2 communication	Huawei, HiSilicon, Panasonic, Potevio, ALU, ALU-Shanghai, Broadcom, Samsung, Fujitsu, LGE, QC, CATR, Coolpad, [CATT]	(R1-142634)

Decision: The document is noted.
Proposal:

- For mode 2 communication: a UE's resource selection for both SA and data is based on sensing the channel for a period of time.
- The following two sensing algorithms can be considered:
  - sensing on the data channel
  - Opportunistic monitoring of SA from other transmitters (not precluding energy sensing on SA)
    - FFS the linkage between SA and data
- For both the algorithms:
  - Each sensing measurement is assumed to be one or more sub-frames
  - Sensing is done every X SA periods – X is FFS (X >= 1)

R1-142663	WF on Mode 2 Resource Selection	Qualcomm Incorporated (Rapporteur)	

Decision: The document is noted.Proposal:

- Following baseline for Mode 2 resource selection is proposed
  - Every SA period:
    - UE randomly selects an ~~first~~ SA resource to transmit on
    - UE randomly selects a T-RPT used for data transmission given

  - Number of transmissions of a MAC PDU
  - Transmission interval between transmissions of multiple MAC PDUs
  - FFS how number of transmissions of a MAC PDU and transmission interval between transmissions of multiple MAC PDUs are determined
- UE randomly selects the frequency resource given a data bandwidth respecting the SC-FDM criterion to used for the initial transmission of the MAC PDU
- FFS whether All UEs have equal priority in the random selections

- AA congestion control mechanism such as slotted aloha or sensing is performed based on monitoring the SA and/or Datamay be introduced in a later release depending on further study
  - Details FFS

Conclusion: Continue discussion until RAN1#78 on the method for Mode 2 resource selection.

R1-142635	WF on Discovery Resource Size	Qualcomm Incorporated, Samsung, ZTE, General Dynamics	

The document was presented by Shailesh Patil from Qualcomm.

- If number of information bits transmitted on a discovery resource is not greater than 256 bits a discovery resource consists of 2 contiguous PRB in frequency and 1 sub-frame without frequency hopping across slots.

Decision: The document is noted, modified and agreed as follows:

Agreements:

- If number of information bits transmitted on a discovery resource is not greater than 256 bits a discovery resource consists of 2 or 3 contiguous PRB in frequency and 1 sub-frame without frequency hopping across slots
- FFS: The number of contiguous PRB in frequency, and down selected between "2" or "3"

Working assumption:

- Repetition (FFS: either contiguous or non-contiguous in time domain) of transmission of a given MAC PDU by a UE within a discovery period is supported
  - For Type 1 discovery, UE performs random selection only for the first discovery resource in the set of discovery resources that can be used for the repeated transmissions of the MAC PDU. The other discovery resources are deterministically associated with the first discovery resource.
    - FFS: Receiver behavior

R1-142636	WF on Discovery Period	Qualcomm Incorporated, ITRI, General Dynamics, Huawei, HiSilicon	

The document was presented by Shailesh Patil from Qualcomm.

- *NOTE: The definition of a discovery period is FFS.*
- Proposal:
  - For Type 1 discovery: Discovery period is a period over which the allocation of resources used for transmission of discovery signals is repeated.
    - Multiple discovery periods of different length are possible.
  - For Type 2B discovery: Discovery period is a period over which resource pool for reception is repeated

Decision: The document is noted, modified and agreed as follows:

Agreements:

- For Type 1 discovery: Discovery period is a periodicity of resources allocated in a cell for discovery transmission
  - Multiple discovery periods of different length are possible
  - FFS: At any given time whether multiple different discovery periods are configured in a cell
- For Type 2B discovery: Discovery period is a periodicity of resources used for reception of discovery transmission from a cell
  - Multiple discovery periods of different length are possible

Not treated.

R1-141923	Resource allocation for type-1 discovery	Huawei, HiSilicon	
R1-141967	Resource allocation for Type 1 D2D discovery	Qualcomm Inc.	
R1-141968	D2D discovery for asynchronous networks	Qualcomm Inc.	
R1-141969	Resource allocation for Mode 2 D2D broadcast communication	Qualcomm Inc.	
R1-142001	Contention method for mode 2 resource allocation	CATT	

R1-142002	Linkage between SA and data resource of D2D communication	CATT	
R1-142003	Resource allocation for Type 1 D2D discovery	CATT	
R1-142016	Distributed Resource Allocation for D2D Communication	Intel Corporation	
R1-142032	On resource allocation for Type 1 D2D discovery	Intel Corporation	
R1-142072	Distributed resource allocation for D2D broadcast	Fujitsu	
R1-142108	Resource allocation for type-1 discovery	Samsung	
R1-142109	Resource pool configuration for type-1 discovery	Samsung	
R1-142110	WAN and D2D priority handling for type-1 discovery	Samsung	
R1-142111	Mode 2 resource allocation for D2D broadcast communication	Samsung	
R1-142148	Resource allocation mode 2 in D2D communication	LG Electronics	
R1-142172	Resource selection for Type 1 discovery message transmission	NEC	
R1-142187	Half duplex issue and solutions in D2D	Panasonic	
R1-142230	SA and data resource allocation for Mode 2	ZTE	
R1-142231	Resource Allocation for Type 1 Discovery	ZTE	
R1-142267	Discussion on resource selection for type 1 discovery	NTT DOCOMO	
R1-142351	Distributed resource allocation for D2D	InterDigital	
R1-142359	Resource allocation/utilization for type-1 discovery	ASUSTeK	
R1-142481	Mode 2 resource allocation for D2D communication	Kyocera	
R1-142482	Resource allocation for Type 1 discovery	Kyocera	
R1-142512	Resource allocation Mode 2 for D2D communication	Potevio	
R1-142574	Resource allocation for Scheduling Assignment	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	(R1-142056)

6.2.5.2.2 eNB resource allocation

Communication

R1-141971	Resource allocation for Mode 1 D2D broadcast communication	Qualcomm Inc.	

The document was presented by Saurabha Tavildar from Qualcomm and proposes:

- Proposal 1: Mode 1 scheduling reuses existing DCI format 0 for D2D grants from eNB.
- Proposal 2: a D2D RNTI distinguishes DCI for D2D from DCI for WAN UL or DL.
- Proposal 3: 0/1A distinction flag in DCI format 0 is re-interpreted for SA/Data distinction.
- Proposal 4: UE sends D2D Start indication to eNB in an RRC message including the Destination ID(s) (Group ID) and corresponding indices (Destination ID index).
- Proposal 5: In response to the D2D start indication from UE, eNB provides a D2D RNTI and other configuration related to D2D communication to this UE in RRC signaling.
- Proposal 6: Retransmission of SA is supported, and retransmission pattern is fixed in the specification.
- Proposal 7: RB assignment field of DCI format 0 is used for indexing into SA-resource pool.
- Proposal 8: eNodeB can send a D2D-SA grant at any time (>= 4 ms.) before SA resource pool occurrence.
- Proposal 9: Destination ID index of 2 bits is included in SA grants to allow UEs to participate in multiple communication sessions (e.g. multiple group communication sessions).
- Proposal 10: the number and pattern of retransmissions of a given packet are signaled through RRC and a D2D-data grant accordingly signals the resources for retransmissions of a packet.
- Proposal 11: SPS scheduling of SA is supported.
- Proposal 12: SPS scheduling for D2D uses existing mechanisms of (i) configuration through RRC signaling and (ii) activation/release through DCI using a SPS-D2D-RNTI.
- Proposal 13: the number and pattern of retransmissions of a given packet signaled through RRC also apply to SPS scheduling of data transmission.
- Proposal 14: DCI format 3/3A are reused for D2D power control by using D2D-TPC-SA-RNTI and D2D-TPC-Data-RNTI for respectively SA and Data power control.
- Proposal 15: A d2d-tpc-Index is provided by higher layers to determine index into the TPC command for a given UE for both SA and Data.

Decision: The document is noted.

R1-142017	eNB Controlled Resource Allocation for D2D Communication	Intel Corporation	

The document was presented by Alexey Khoryaev from Intel and proposes:

- **Error! Reference source not found.**
  - Periodicity and configuration of SA resource pool for D2D reception is configured by eNodeB and broadcasted to D2D capable UEs via SIB signaling.
  - In synchronous networks, UE assumes that SA resources are aligned across cells.

  - eNodeB informs UEs about the location of SA resources in neighboring cells, if the latter are not aligned across network.
- **Error! Reference source not found.**: In Mode-1, the D2D data transmission resources are explicitly signaled in SA, using predefined patterns configured by eNodeB.
- **Error! Reference source not found.**: Further discuss RAN1-specific details of the required D2DSR content and inform RAN2 WG in order to assist eNB selection in terms of SA, data resource allocation.
- **Error! Reference source not found.**
  - Agree on the content of the D2D scheduling grant provided in **Error! Reference source not found.**.
  - Single D2D scheduling grant is used to indicate SA resource and data transmission pattern.
  - Explicit timing is defined between the time instance when D2D transmitter has received the D2D scheduling grant from eNodeB and the time instance when D2D transmitter sends D2D control information in scheduling assignment resource pool
- **Error! Reference source not found.**: Agree on the content of the D2D control information signaled over direct link in scheduling assignment resources.
- **Error! Reference source not found.**: D2DCIs are transmitted on SA resources which are multiplexed in time and frequency in order to mitigate half-duplex and in-band emission problems.
- **Error! Reference source not found.**
  - The bitmap mechanism is used to indicate the set of available resource patterns of transmission for direct communication.
  - Multiple resource patterns of transmission are configured and signaled by eNodeB. The number of RPTs is for further discussion and analysis.
  - The data transmission patterns in time and the frequency allocation are separately indicated.
- **Error! Reference source not found.**: Retransmission pattern defines the rule between initial packet transmission and its retransmission in consecutive subframes, including the control of redundancy versions.

Decision: The document is noted.

R1-142004	On mode 1 resource allocation for broadcast communication	CATT	

The document was presented by Ms Ying Peng from CATT and proposes:

- Proposal 1: UE should at least provide the following information when requesting resource from eNodeB.
  - Amount of data to transmit (BSR)
  - L1/L2 identities: target ID (broadcast ID, group ID or unicast ID)
- Proposal 2: No additional measurement and reporting is supported for D2D resource allocation in Rel-12.
- Proposal 3: Support both SPS and dynamic scheduling for SA and data in Rel-12.
- Proposal 4: Use DCI format 0 to carry D2D SA/data grant.CRC of the DCI is scrambled by network configured D2D-RNTI.
- Proposal 5: SA and data grant are transmitted in separate DCI with the same format. They are distinguished by a flag bit.
- Proposal 6: Consider to use several flag bits in DCI to distinguish SPS and dynamic scheduling.

Decision: The document is noted.

R1-142112	Mode 1 resource allocation for D2D broadcast communication	Samsung	

The document was presented by Thomas Novlan from Samsung and concludes:

- Observation 1: The existing cellular resource request and resource assignment procedure should be taken as the baseline for Mode 1 resource allocation as much as possible.
- Observation 2: It is beneficial for SA and data resources to have a partial overlap to support communication between UEs operating in Mode 1 and Mode 2.
- Observation 3: It is beneficial to support the same SA design for Mode 1 and Mode 2.
- Proposal 1: A new D2D BSR should be used to distinguish between D2D and cellular resource allocation requests.
- Proposal 2: Utilizing an existing UL allocation DCI format size for D2D resource allocation for Mode-1 should be taken as baseline for Rel-12.
- Proposal 3: RAN1 should consider the following alternatives for differentiating Mode 1 D2D and cellular resource allocation grants:
  - Alternative-1A: Introduce a new UE-specific RNTI for D2D resource allocation (D2D-RNTI)
  - Alternative-1B: Use the timing relationship between the DCI reception and resource configuration to differentiate between D2D and cellular resource allocations
  - Alternative-1C: Use the existing C-RNTI and a predefined mask to scramble the CRC of the DCI for D2D resource allocation
  - Alternative-1D: Introduce fixed codepoint(s) or conditions on field(s) within the DCI to differentiate between D2D and cellular grants
- Proposal 4: A single resource allocation grant can be provided by the eNB for D2D data and SAs transmission.

Decision: The document is noted.

WFs

R1-142598	WF on Mode 1 D2D Grant	Qualcomm Incorporated, Huawei, HiSilicon, LGE, General Dynamics, ZTE	

The document was presented by Shailesh Patil from Qualcomm.

- For Mode 1, DCI format which is same size as DCI format 0 is used for allocating D2D Data and SA
  - FFS: same or separate grant for D2D Data ~~as~~ and SA
  - For Mode 1, a D2D RNTI is used to distinguish a grant for WAN from grant from D2D

Discussion: Also supported by Kyocera, Fujitsu, Sharp, Microsoft, III
Ericsson → cannot agree with the statement "same size as DCI format 0" – same for Intel as content is unknown
Decision: The document is noted, modified as follows:
Working assumption:

- For Mode 1, DCI format which is same size as existing DCI format 0 is used for allocating D2D Data and SA
  - Same grant for D2D Data and SA
  - For Mode 1, a D2D RNTI is used to distinguish a grant for WAN from grant from D2D

R1-142602	WF on UE feedback in mode 1 resource allocation	Panasonic, LG Electronics	

The document was presented by Lilei Wang from Panasonic.

- UE provides long-term feedbacks to the network to determine time/frequency resources and MCS.
  - Candidates are at least
    - Long-term suggested MCS in D2D channels
    - Long-term power and/or interference measurement per D2D resource
    - Resource utilization observed by D2D UE
- eNB decides MCS using above information and sends it to the UE via D2D grant

Discussion: Also supported by Huawei, HiSilicon.
Decision: The document is noted. Continue offline discussion until Tuesday – Lilei (Panasonic)
Conclusion: no consensus.

Tuesday 20th session
Multi-carrier D2D

R1-142579	Summary of Email Discussion [76b-12] on Multi Carrier Operation for D2D	Ericsson	

The document was presented by Stefano Sorrentino from Ericsson and lists the following observations:

- At least for communication there seems to be a clear majority of companies that see the advantage of being able to receive simultaneously on the DL and UL spectrum of FDD carriers supporting D2D.
- For discovery, the majority in favour of two independent receiver chains for UL and DL is not as large as for communication.
- D2D capabilities may be considered jointly with CA capabilities
- From a PS perspective, the only multi-carrier scenario prioritized in Rel-12 consists of a UE roaming cellular on a VPLMN but performing D2D on PS spectrum.

Discussion: Qualcomm → not clear whether there is a "clear majority" (first bullet)
CATT: Clarification from SA2 required w.r.t public safety UEs behavior
Ericsson: Want to understand what the consequences are if RAN1 receive positive or negative reply from SA2/same applies to RAN4'reply
Decision: The document is noted and is modified as follows:

Working assumption with a condition to reception of reply LSs:

- For communication, RAN1 assumes that UE is able to receive simultaneously on the DL and UL spectrum of FDD carriers supporting D2D
- For discovery, RAN1 assumes that UE may not be able to receive simultaneously on the DL and UL spectrum of FDD carriers supporting D2D
- Send LS to RAN2, RAN4, and SA2
  - RAN2:
    - To investigate impact on UE capability signalling of restriction on cellular operation when D2D is operated
    - [Public safety UEs are assumed to be able to simultaneously perform cellular on DL carrier and D2D on associated UL carrier for FDD band]
    - For discovery, non-public safety UE may not be able to receive simultaneously on the DL and UL spectrum of FDD carriers supporting D2D

        - There is no simultaneous operation of CA and D2D required for Rel-12 D2D communication if we assume 2 DL CA capable UEs
    - RAN4:
        - RAN1 asks feasibility and implication of simultaneous reception of cellular on DL spectrum and D2D associated UL spectrum for FDD band
        - RAN1 asks feasibility and implication of single receiver chain switching between cellular spectrum and D2D reception associated UL spectrum for FDD band
    - SA2:
        - [Public safety UEs are assumed to be able to simultaneously perform cellular on one carrier and D2D on another carrier]
- Prepare a draft LS in R1-142646 as soon as possible, with the expectation that replies may arrive during this week – Ericsson

Possible observations:

- At least for communication there seems to be a clear majority of companies that see the advantage of being able to receive simultaneously on the DL and UL spectrum of FDD carriers supporting D2D
- For discovery, there is no clear majority between two independent receiver chains for UL and DL
- D2D capabilities may be considered jointly with CA capabilities
- From a PS perspective, the only multi-carrier scenario prioritized in Rel-12 consists of a UE roaming cellular on a VPLMN but performing D2D on PS spectrum
- For discovery, inter-PLMN monitoring is considered as the main target to introduce single receiver chain UE

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Tuesday evening

R1-142646	[Draft] LS on D2D Multicarrier Capabilities	Ericsson	

The document was presented by Stefano Sorrentino from Ericsson.
Discussion: Following sentence [Public safety UEs are assumed to be able to simultaneously perform cellular on DL carrier and D2D on associated UL carrier for FDD band] is missing?
Nokia → asked to clarify the meaning of "above agreements are subject to positive resolution". Qualcomm → better to delete the all sentence.
Fix typo in distribution list (RAN4 instead of RAN2) and correction of references to future meetings
Decision: The document is noted and final LS is agreed in R1-142652.

Observations:

- From a PS perspective, the only multi-carrier scenario prioritized in Rel-12 consists of a UE roaming cellular on a VPLMN but performing D2D on PS spectrum
- For discovery, inter-PLMN monitoring is considered as the main target to introduce single receiver chain UE

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R1-142078	Public safety perspective on multi-carrier operations for D2D group communications	U.S. Department Of Commerce	

The document was presented by Ken Loa from USDoC and proposes:

- Proposal 1: The following scenario for public safety D2D group communication is the baseline of multi-carrier/inter-PLMN for release 12:
    - A roaming UE, whose HPLMN is a public safety operator and VPLMN is a commercial operator, can perform D2D operations in the public safety operator's spectrum when authorized.
- Proposal 2: The UE that requires the capability of public safety D2D group communication is a UE with Carrier Aggregation (CA) capability. There is no simultaneous operation of CA and D2D required for public safety group communication.

Decision: The document is noted.

Not treated.

R1-141924	eNB resource allocation for mode-1 D2D communication	Huawei, HiSilicon	
R1-141970	Resource allocation for Type 2B D2D discovery	Qualcomm Inc.	
R1-142005	Resource pool allocation for D2D communication	CATT	
R1-142033	Discussion on Type 2 D2D discovery procedure	Intel Corporation	
R1-142057	Resource allocation for D2D Discovery	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-142073	eNB controlled resource allocation for D2D broadcast	Fujitsu	
R1-142113	Resource allocation for type 2B discovery	Samsung	
R1-142150	Operational procedure in Mode 1 for D2D communication	LG Electronics	

R1-142151	Type 2 resource allocation mechanisms for D2D discovery	LG Electronics	
R1-142152	Multiplexing issues of WAN and D2D	LG Electronics	
R1-142153	Coexistence issues of WAN and D2D on multiple carriers	LG Electronics	
R1-142173	D2D and cellular resource multiplexing configuration	NEC	
R1-142188	MCS report in mode 1 resource allocation	Panasonic	
R1-142189	D2D grant design in mode 1 resource allocation	Panasonic	
R1-142205	Collision Avoidance Mechanism with Cellular Network for D2D Communication	Sharp	
R1-142206	Physical Channel Design for D2D SA and Data Transmission	Sharp	
R1-142207	Aspects of resource pool configuration for D2D communication	Sharp	
R1-142232	SA and data resource allocation for Mode 1	ZTE	
R1-142233	Resource Allocation for Type 2B Discovery	ZTE	
R1-142268	Discussion on Inter-cell type 2B discovery	NTT DOCOMO	
R1-142293	Resource allocation scheme for in-coverage D2D communication to support Mode 1 and Mode 2	III	
R1-142294	Decision metric for D2D communication	Czech Technical University in Prague, IAESI	
R1-142295	D2D physical channels and signals	CEA, IAESI	
R1-142360	Resource Hopping Mechanism for Type 2B Discovery	ASUSTeK	
R1-142429	Resource allocation for D2D Mode 1 communication	Microsoft Corporation	
R1-142448	Timing and resource pools of Type 2B discovery signals	Nokia, NSN	
R1-142449	Dynamic control of D2D discovery resources	Nokia, NSN	
R1-142450	Pattern design and resource allocation for discovery Type 2B	NSN, Nokia	
R1-142483	Mode 1 resource allocation for D2D communication	Kyocera	
R1-142484	Multi carrier operations for D2D	Kyocera	
R1-142485	Coexistence of D2D discovery and WAN	Kyocera	
R1-142537	eNB resource allocation for D2D Communication Mode 1	InterDigital	
R1-142544	Resource allocation for type-2B discovery	Huawei, HiSilicon	

R1-142660	WF on Type 2B hopping pattern	Huawei, HiSilicon, Intel, Qualcomm	

Decision: The document is noted.

Proposal:

- The following deterministic time-frequency hopping pattern is used for type 2B discovery:
- $next\_n_f = (n_f + floor(N_f/2)) \ modulo \ N_f$
- $next\_n_t = (n_t + n_f) \ modulo \ N_t$

with

- (n_t, n_f): (time, frequency) resource in the current discovery period,
- N_f number of freq resources per subframe,
- N_t number of subframes per discovery period

Agreement:

- The time-frequency hopping pattern(s) used for type 2B discovery is/are deterministic
  - Details to be decided at RAN1#78

Conclusion:

Agree the design goals for the pattern by Friday - R1-142665 (Weidong).

Patterns for consideration to be provided by email by 5th June, then discuss following possible agreements until 17th June, then evaluations/analysis/thoughts to be provided at RAN1#78 – Hossein (HW).

Possible agreements:

- For Half duplex, a pattern tries to make sure that two discovery resources are at least once not transmitted on the same sub-frame at least across discovery periods.
- For in-band emission, a pattern that tries to minimize the number of times two discovery resources occur on the same sub-frame at least across discovery periods
- Additional consideration can include avoidance of cellular spectrum fragmentation in the discovery subframe

Friday 23rd

R1-142665	Summary of design goals on Type 2B discovery	NSN	

Decision: The document is noted.

6.2.5.2.3 Definitions of in-coverage, out-of-coverage, edge-of-cell coverage

Way Forward: Check the RAN2 decisions related to Mode1 and Mode2 configuration and usage made during this week. Revisit this topic at RAN1#78.

Not treated.

R1-142018	On D2D Resource Allocation Modes and In/Edge/Out of Coverage Definition	Intel Corporation	
R1-142058	Definition of in-coverage, out-of-coverage, and edge-of-cell coverage	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142114	Definitions of in-coverage, out-of-coverage, edge-of-cell coverage	Samsung	
R1-142154	Resource allocation mode decision at D2D UE under eNB controllability	LG Electronics	
R1-142190	D2D coverage definition	Panasonic	
R1-142208	D2D Network Coverage Definition & Mode Selection	Sharp	
R1-142404	On Metric and Procedures for In/Out of NW coverage detection for D2D	Ericsson	
R1-142451	Relationship between coverage conditions and D2D operation	Nokia, NSN	
R1-142531	ProSe device-to-device coverage definitions	General Dynamics UK	
R1-142543	Definition of coverage zones for D2D communication	Huawei, HiSilicon	

6.2.5.2.4 Other

R1-141976	Simulation results for D2D and WAN coexistence	Qualcomm Inc.	

Decision: The document is noted.

R1-142685	Analysis of Mutual Impact of WAN and D2D Communication	Intel Corporation	(R1-142019)

Decision: The document is noted.

R1-142059	Evaluation of Impact of D2D to WAN system performance	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

Decision: The document is noted.

R1-142115	Evaluation of D2D impact on WAN: PUCCH performance	Samsung	

Decision: The document is noted.

R1-142116	Evaluation of D2D impact on WAN: DL throughput	Samsung	

Decision: The document is noted.

R1-142155	Evaluation Results for D2D and WAN Co-existence	LG Electronics	

Decision: The document is noted.

R1-142623	WF on D2D Power Control	Qualcomm Incorporated, LGE, Samsung, ITRI, III	

Decision: The document is noted. Also supported by NSN, Nokia, Fujitsu.

Agreement:

- Open loop power control mechanism is specified for in-coverage UEs for Mode 2 communication and Type 1 and Type 2 discovery
  - Values of P_0 and alpha are signalled by higher layers (let RAN2 decide details)
    - Different values of P_0 and alpha can be used for Type 1 discovery, Type 2 discovery, and communication
      - One of the values of alpha available is 0.
    - Values of P_0 and alpha that lead to transmission at Pcmax by all UEs are supported

R1-142632	WF on multiplexing UL HARQ-ACK TX and D2D TX/RX	LG Electronics, Huawei, HiSilicon, Potevio, NEC	

Decision: The document is noted.

Proposal:

- To minimize the impact of collision between UL HARQ-ACK TX and D2D TX/RX, UL HARQ-ACK TX can be shifted to a later non-D2D subframe.
  - Existing TDD A/N mechanisms should be reused as much as possible.
    - Details FFS (e.g. using a reference HARQ configuration).

Conclusion: Continue discussion at RAN1#78.

R1-142644	WF on resource grouping for D2D type-1 discovery	Samsung, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, LGE	

Decision: The document is noted.
Proposal:
- RSRP based resource grouping is supported for type-1 discovery
- There are two groups within a discovery signal transmission resource pool
- Different subframes are assigned to each group
- Group is selected by a UE for discovery signal transmission based on UE RSRP measurement or DL path-loss
- Resources for each group and RSRP threshold (or DL Path-loss threshold) are configured by the network

Conclusion: Continue discussion at RAN1#78.

Not treated.

R1-142074	Interference management between D2D and WAN	Fujitsu	
R1-142117	D2D PUSCH impact on WAN PUCCH	Samsung	
R1-142191	Evaluation on spatial interference to WAN by D2D	Panasonic	
R1-142234	Performance evaluation of D2D and WAN co-existence	ZTE	
R1-142245	Further discussion on the Multiplexing of Cellular and D2D signals	ITRI	
R1-142269	Evaluation of inband emission impact of D2D discovery	NTT DOCOMO	
R1-142339	Evaluation of D2D and cellular coexistence	Huawei, HiSilicon	
R1-142405	On inband co-existence of cellular and D2D UEs	Ericsson	
R1-142406	Inter-Carrier and Inter-Cell Aspects of D2D Discovery and Communication	Ericsson	
R1-142407	Discussion on UE Multi-Carrier D2D Capabilities	Ericsson	
R1-142486	Simulation result on WAN impact of D2D communication	Kyocera	

6.2.5.3 D2D synchronization

For both D2D discovery and broadcast communication

6.2.5.3.1 Resource allocation for synchronization signals and channels

Tuesday

R1-142599	WF on Relaying Synchronization Signals for Discovery	Qualcomm Incorporated, LGE, General Dynamics, ZTE, DoCoMo	

The document was presented by Shailesh Patil from Qualcomm.
- For Type 1 discovery
  - For a cell, within a discovery period, the first sub-frame of the transmission pool can be used for transmitting the D2DSS
  - If Type 1 is configured using SIB then the D2DSS sequence transmitted is configured using SIB
  - Else sequence transmitted can be configured using dedicated RRC signaling
- For Type 2B discovery
  - eNodeB can instruct transmission of D2DSS
- For both Type 1 and Type 2B the reception pool information should contain information (implicitly or explicitly) on which resources and sequences UE should monitor for D2DSS

Discussion: Huawei→ add "…which time resources and sequences UE should…" in last main bullet.
Decision: The document is noted, modified and agreed as follows:

Agreements:
- D2DSS transmission configuration is the same between D2D discovery and D2D communication if NW supports both D2D communication and discovery
- For Type 1 discovery
  - For a cell, within a discovery period, the first sub-frame of the transmission pool can be used for transmitting the PD2DSS and SD2DSS by UEs transmitting discovery signals
  - If Type 1 resource pool is configured using SIB then the PD2DSS and SD2DSS sequence transmitted is configured using SIB
    - The same PD2DSS and SD2DSS sequences is used for D2D communication
  - Else sequence transmitted can be configured using dedicated RRC signaling
- For Type 2B discovery
  - eNodeB can instruct UE to transmit PD2DSS and SD2DSS

- For both Type 1 and Type 2B the reception pool information contains information (implicitly or explicitly) on which time resources and sequences UE should monitor for PD2DSS and SD2DSS if transmission of PD2DSS and SD2DSS is configured
  - FFS: If all discovery UEs transmit D2DSS

Not treated.

R1-141919	Resource allocation for D2D synchronization signals	Huawei, HiSilicon	
R1-141973	Resource allocation for D2D Synchronization	Qualcomm Inc.	
R1-142006	Resource allocation for D2D synchronization	CATT	
R1-142060	Resource allocation for D2D synchronization signals	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-142118	TDM resource allocation for D2D synchronization	Samsung	
R1-142157	Discussion on resource allocation for D2D synchronization	LG Electronics	
R1-142235	Resource allocation for synchronization signal and channel	ZTE	
R1-142315	Resource Allocation for D2D Synchronization	Intel Corporation	
R1-142487	Synchronization resource allocation	Kyocera	

6.2.5.3.2 Synchronization signal and channel design

R1-141974	Signal Design for D2D Synchronization	Qualcomm Inc.	

The document was presented by Saurabha Tavildar from Qualcomm and concludes:

- Observation 1: In addition to carrying information, PD2DSCH can be used to (i) detect false alarms for D2DSS detection (ii) resolve CFO ambiguity from D2DSS detection.
- Proposal 1: a PD2DSCH is defined for carrying information and assisting reliable D2DSS detection.
- Proposal 2: D2DSS and PD2SCH design shown in Figure 2-1 is used.
- Observation 2: the proposed D2DSS design enables a symbol-level search algorithm for time acquisition, while the Rel-8 design (Alt-1) requires at least a CP-level search, with a factor of around N_{FFT}/N_{CP} more complexity.
- Observation 3: the proposed D2DSS design improves the time acquisition performance by around 4 dB compared to the Rel-8 like design.
- Observation 4: the proposed D2DSS design improves the frequency estimation performance by a factor of 6 and 16 compared respectively to Alt-2 and Alt-1 (Rel-8 like) designs.
- Observation 5: the proposed D2DSS design meets the 0.1 ppm accuracy criterion in [5] whereas the Rel-8 like design doesn't meet this criterion. We note that in a WAN system, UEs can rely on other DL reference signals for accurate frequency synchronization in addition to Rel-8 PSS/SSS.
- Proposal 3: D2DSS does not need to consist of a SD2DSS.
- Proposal 4: If RAN1 decides on using SD2DSS in D2DSS design, Rel-8 SSS structure with SC-FDM mapping and limiting the SSS space to a set of sequences with low CM/PAPR values and small cross-correlation should be used. Appendix-A provides the list of these SSS ID candidates.

Discussion: Ericsson: does latency delay requirement be considered?
Decision: The document is noted.

R1-142340	D2DSS design	Huawei, HiSilicon	

The document was presented by Fredrik Berggren from Huawei and proposes:
Proposal 1. The PD2DSS includes 2 PD2DSS sequences - the sequences encode whether the synchronization source has obtained a reference timing from an eNodeB. The SD2DSS includes 336 SD2DSS sequences – the sequences encode 168 synchronization source IDs and subframe timing – and the existing 2x168=336 SSS sequences are reused.

Proposal 2. The PD2DSS sequence is

$$d_u(n) = \begin{cases} e^{-j\frac{\pi u n(n+1)}{63}}, & n = 0,1,\dots,30 \\ e^{-j\frac{\pi u (n+1)(n+2)}{63}}, & n = 31,32,\dots,61 \end{cases}$$

where $u \notin \{25,29,34\}$ and the sequence is mapped to resource elements to be centrally symmetric around the DC frequency.
Proposal 3. Subframe timing is encoded by SD2DSS OFDM symbol positions and by utilizing SSS sequences from subframe 0 in the first slot and SSS sequences from subframe 5 in the second slot, of the D2DSS subframe, respectively.
Proposal 4. The antenna port for PD2DSS is unspecified and the SD2DSS utilizes the same antenna port as the PD2DSS.
Proposal 5. The D2DSS is transmitted in one subframe, with a pre-defined period of 40 ms.
Proposal 6. The PD2DSS is located equidistantly with a separation of at least 2 OFDM symbols.
Decision: The document is noted.

R1-142409	Synchronization Signals and Channel Design for D2D	Ericsson	

The document was presented by Stefano Sorrentino from Ericsson and lists the following proposals:

- Reuse PSS/SSS sequences for D2DSS
  - SD2DSS may have lower tx power than PD2DSS
- Map control information to D2DSS according to **Error! Reference source not found.**
- Agree on introduction of PD2DSCH
- There is a one-to-one association between D2DSS and PD2DSCH (for each sync hop number)
- The periodicity of PD2DSCH is X times of D2DSS
  - For PS carriers the PD2DSCH periodicity is 5-25 times larger than that of D2DSS
- PD2DSCH is only transmitted in subframes carrying also D2DSS with the same sync hop number
- The bandwidth of PD2DSCH is same as D2DSS
- A GP of one OFDM symbol is used at the end of PD2DSCH.
- Considering that even RRC_IDLE UEs may transmit PD2DSCH, the DL timing can be used for PD2DSCH transmission
- The content of PD2DSCH is according to **Error! Reference source not found.**.
- PD2DSCH is transmitted with QPSK, 6 PRBs, eCP, 1 symbol GP, DL timing.
- TDM between different hop count numbers for D2DSS/PD2DSCH
- TDM between D2DSS/PD2DSCH and cellular is preferred (with the exception of PUCCH)
- Extended CP is used for D2DSS and PD2DSCH
- PS UEs transmit D2DSS with periodicity of 40ms and PD2DSCH with periodicity of 2.56s
- Commercial UEs do not transmit D2DSS

Discussion: CATT why the difference FDD/TDD and request clarifying the sync hop number
Decision: The document is noted.

R1-142532	ProSe device-to-device synchronisation signal and channel design	General Dynamics UK	

The document was presented by Mark Cannon from GDUK and proposes:

- Proposal 1: The D2DSSs which are not an independent synchronisation source (i.e. they are Type 2 or Type 3) should use synchronisation signals which are distributed and are combined in an SFN manner.
- Proposal 2: The synchronisation signals from an eNode B, a cluster head and those relayed by other UEs are distinguished from each other by employing different non-overlapping groups of synchronisation sequences for each purpose.
- Proposal 3: Furthermore, the relayed synchronisation signals from UEs which are in coverage of a conventional cell, and UEs which are out of coverage of a conventional cell but in coverage of another synchronisation source can be distinguished by using different groups of sequences.
- Proposal 4: The PD2DSCH will relay information on the resource pool that has been signalled by the eNode B. Other fields in the message are FFS.
- Proposal 5: UEs in a given cell or cluster which send PD2DSCH will use identical signals so that they can be SFN combined.
- Proposal 6: The PD2DSCH channel design should be based on the PUSCH.
- Proposal 7: It may not be necessary to transmit a PD2DSCH in out of coverage scenarios.
- Proposal 8: There is no need to include the SD2DSS as part of the D2DSS.

Decision: The document is noted.

At this point, Mr Chair drew the following:

- PD2DSCH is specified for indication of D2D configuration
  - ALU/ASB/Huawei/Microsoft concern and find premature to specify PD2DSCH
- D2DSS consists of PD2DSS and SD2DSS
    - Huawei: concern not having SD2DSS if there are multiple PD2DSS symbols in a subframe
  - TDM between PD2DSS and SD2DSS
  - PD2DSS and SD2DSS have OFDM based format
    - Qualcomm/LGE/GDBUK/ZTE/Microsoft: concern of OFDM based format for SD2DSS and the necessity of SD2DSS
- Different root index for PD2DSS from PSS is used
  - Broadcom, Ericsson: PSS root index is sufficient for PD2DSS
- Following information is indicated by D2DSS
  - Source type
  - FFS: other information
- Following information is indicated by D2DSS or PD2DSCH if specified
  - TDD/FDD
  - TDD config.
  - System frame number
  - Synchronization ID

- Current stratum level
- Resource pool
  - FFS: Detailed definition
- FFS: other information

Continue offline discussion until Tuesday – Saurabh (Qualcomm)

Agreements:

- PD2DSCH is specified at least for indication of out of coverage D2D transmit resource pool or D2D frame number
  - D2D frame number is a frame number used for D2D communication
    - FFS: Detailed of D2D frame number
    - FFS: Whether and how to resolve conflict of D2D UEs with different knowledge of D2D frame number
- SD2DSS is specified
- If D2D transmitter is in-coverage, D2D frame number is derived from SFN

R1-142452	D2D synchronization signal design	Nokia, NSN	

The document was presented by … from Nokia and draws the following conclusion:

- The type of synchronization source information should be conveyed by D2DSS and the stratum number of the current D2DSS transmission can be carried as well to provide further accuracy information of the detected synchronization source.
- *Observation 1: Whether D2DSS carrying synchronization source ID information or not is depended on the ProSe requirements and the identified benefits on top of the case where only the type of synchronization source is identified.*
- *Observation 2: Resource allocation for data and/or control signaling is not targeted for synchronization usage and should not be carried by D2DSS or PD2DSCH.*
- *Observation 3: Clear need and potential benefits should be identified before defining PD2DSCH to support D2D synchronization.*
- D2DSS should include both PD2DSS and SD2DSS equivalent to PSS & SSS to convey necessary information for D2D synchronization.
- D2DSS uses the OFDM based waveform, i.e. 1a or 1b is adopted to specify D2DSS.
- *Observation 4: D2DSS should be different from PSS/SSS used in TDD frame structure, in order to avoid bringing negative performance impacts on legacy UEs. One mechanism to differentiate D2DSS from cellular PSS/SSS in TDD frame structure is to use a different sequence for PD2DSS than the ones used for PSS.*

Decision: The document is noted.

Not treated.

R1-142007	Design of D2DSS and PD2DSCH	CATT	
R1-142020	Discussion on D2D Synchronization Channel (PD2DSCH)	Intel Corporation	
R1-142021	On Synchronization Signal Design for D2D Communication	Intel Corporation	
R1-142061	Considerations for design of D2D Synchronization	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-142119	D2D synchronization procedure for resource pool configuration	Samsung	
R1-142120	D2D Synchronization Signal and Channel Design	Samsung	
R1-142158	On the D2D-related information sharing between in-coverage UEs and out-coverage Ues	LG Electronics	
R1-142236	D2D Synchronization Signal and Channel Design	ZTE	
R1-142282	D2DSS design	Broadcom Corporation	
R1-142352	Synchronization signal and channel design for D2D	InterDigital	
R1-142488	Synchronization signal and channel design	Kyocera	
R1-142530	Considerations on D2D synchronization signal design	ITL Inc.	
R1-142576	Discussion on design of D2D synchronization signal	LG Electronics	(R1-142156)
R1-142601	On PD2DSS Design and Impact of Large Initial Carrier Frequency Offset	Intel Corporation	

R1-142655	WF on Synchronization Signal	Qualcomm Incorporated, General Dynamics, LG Electronics, Huawei, HiSilicon	(R1-142630)

Working Assumption:

- A synchronization resource contains
  - In a sub-frame:
    - FFS whether 1 or 2 symbols are PD2DSS
      - If 2 symbols, sequences in the different PD2DSS symbols use the same root indices
    - FFS whether 1 or 2 symbols are SD2DSS
    - Number of symbols for PD2DSS will not be less than the number of symbols for SD2DSS
    - Exact symbol locations are FFS
- PD2DSS is 62 length Rel-8 PSS sequence mapped centrally symmetric around D.C. frequency – FFS if root indices are same or different than Rel-8 PSS root indices (note that if OFDM and Rel-8 PSS root indices, then the waveform would be the same as Rel-8 PSS)
  - FFS: if PD2DSS is OFDM or SC-FDM without DFT pre-coding
- FFS if SD2DSS is OFDM or SC-FDM
  - If SD2SS is SC-FDM, FFS if it is DFT pre-coded

Companies can check performance of PD2DSS ZC sequence until RAN1#78 in presence of frequency offset.

6.2.5.3.3 Synchronization procedure

Mr Chair's recommendation: Note that inter-cell D2D is supported, but with no standardized inter-cell coordination based on X2 or air interface (i.e., no RAN1 discussion on inter-cell coordination)

Synchronization procedure

R1-141975	Procedures for D2D synchronization	Qualcomm Inc.	

The document was presented by Saurabha Tavildar from Qualcomm and proposes:

- Proposal 1: procedure shown in Figure 2-1 of R1-141975 is adopted as overall synchronization procedure on a given carrier with rules for selection/reselection of synchronization sources for further discussion.
- Proposal 2: for in-network, UEs can select between multiple eNodeBs based on RSRP and earliest time of arrival.
- Proposal 3: Synchronization sources whose timing was originally derived from eNBs up to a pre-specified maximum stratum level have a higher priority compared to the synchronization sources which are following timings from ISS.
- Proposal 4: Among synchronization sources whose timing was originally derived from eNodeB, following rules are further used in that order (i) lower stratum levels (ii) earliest time of arrival.
- Proposal 5: partial network scenario should follow a hierarchical structure with eNodeBs at stratum 0.
- Proposal 6: value of X dBm can be a pre-configured option with X = infinity as one of the options.
- Proposal 7: out of network scenario should follow a flat structure.

Decision: The document is noted.

R1-142009	Discussion on D2D synchronization procedure	CATT	

The document was presented by Ms Ying Peng from CATT and is summarized as follows:

Proposal 1: The synchronization procedure in out-of-coverage scenarios is:

- Stratum level is used for a D2D UE to select reference synchronization source.
- No limit to the actual hop number of synchronization reference derived from ISS, but the maximal stratum level is limited to 2.
  - The stratum level of D2DSS transmitted by ISS is set to be 0.
- When an ISS detects the D2DSS from other ISSs or eNB via one or multiple hops, it can follow the synchronization of the detected D2DSS.

Proposal 2: The synchronization procedure in partial coverage scenarios is:

- Stratum level is used for a D2D UE to select reference synchronization source.
- No limit to the actual hop number of synchronization reference derived from eNB, but the maximal stratum level of D2DSS is limited to 2.
  - The stratum level of D2DSS transmitted by in-coverage UEs is set to be 0.

Proposal 3: The following criterion is additionally used for selection of synchronization reference.

- D2DSS of D2D Synchronization Sources derived from eNB have a higher priority than D2DSS of D2D Synchronization Sources derived from UE;
- The D2DSS with lower stratum level has higher priority than the D2DSS with higher stratum level if the synchronization type is the same.
  - The maximal stratum level of D2DSS is limited to 2.
  - The stratum level of D2DSS transmitted by ISS and in-coverage UEs is set to be 0.
- The D2DSS with higher receiving power has higher priority than the D2DSS with lower power if synchronization type and stratum level are the same.

Proposal 4: To ensure the traffic continuity, an out-of-coverage UE is only allowed to reselect its reference synchronization source in a long-time manner.

Decision: The document is noted.

R1-142237	D2D Synchronization procedure	ZTE	

The document was presented by Yifei Yuan from ZTE and proposes:

- Proposal 1: In partial network coverage, eNB should decide which and how in-coverage UEs (including connected UEs and idle UEs) would relay the synchronization reference of the network.
- Proposal 2: In out of network coverage scenario, both edge UE and data bearing UE should transmit D2DSS.

Decision: The document is noted.

R1-142626	D2D synchronization procedure for out-of-network coverage	Samsung	(R1-142122)

The document was presented by … from Samsung and concludes:

- Observation 1: Design aspects for flat synchronization scheme are synchronization performance, selection criteria, the length of information, and convergence time.
- Observation 2: Design aspects for hierarchical synchronization scheme are synchronization performance, and selection criteria.
- Observation 3: Design aspects for inter-cluster synchronization scheme are synchronization performance, the condition to become synchronization source, selection criteria, the length of information and convergence time.
- Observation 4: TTS(Time to Scan) can be applicable to various synchronization schemes for out-of-coverage scenario.
- Proposal 1: Age-based synchronization scheme is preferred for out-of-coverage UEs if the length of age up to 8 or 16 bits is affordable to be indicated in PD2DSCH.
- Proposal 2: PCO-based synchronization scheme is preferred for out-of-coverage UEs if the length of information to be indicated should be minimized.
- Proposal 3: Synchronization Source UE should indicate its TTS value for out-of-coverage UEs.

Decision: The document is noted.

R1-142410	Synchronization Procedures for D2D	Ericsson	

The document was presented by Stefano Sorrentino from Ericsson and proposes:

- The synchronization procedure conveys information at least about:
  - D2D resource pools to be used for transmission
  - D2D resource pools to be used for reception
  - Useful information regarding the synchronization source identity and reliability
- In-coverage UEs adapt their receiver synchronization according to:
  - Serving eNB signalling on SIB (both for the serving cell and other cells pools)
  - D2DSS/PD2DSCH by out of coverage PS UEs (only for PS receivers)
- Out-of-coverage PS UEs adapt their receiver synchronization according to:
  - D2DSS/PD2DSCH by in-coverage PS UEs (only for PS receivers)
  - D2DSS/PD2DSCH by out of coverage PS UEs (only for PS receivers)
- In-coverage UEs adapt their transmitter synchronization according to:
  - Serving eNB PSS/SSS and signalling on SIB
- Out-of-coverage PS UEs adapt their transmitter synchronization according to:
  - D2DSS/PD2DSCH by in-coverage PS UEs
  - D2DSS/PD2DSCH by out of coverage PS UEs
  - Internal synchronization/pre-configuration
- The serving eNB broadcasts PSS/SSS along with the D2D resource pools for discovery and communication, both for reception (from multiple cells) and transmission
- As a baseline, all PS UEs transmit D2DSS/PD2DSCH according to their selected transmit synchronization
- Optimizations may be considered if time allows for them (e.g., only out of coverage and cell-edge PS UEs transmit D2DSS/PD2DSCH)
- UEs that transmit D2DSS/PD2DSCH use the SSID of the D2DSS/PD2DSCH from which they derive their transmit synchronization (if any)
- The synchronization procedure prioritizes eNB synchronization over UE-SS
- Different synchronization procedures are followed for the receiver and the transmitter
- UEs may transmit D2DSS/PD2DSCH derived from D2DSS/PD2DSCH received from a certain eNB or independent synchronization source by at most n hops
  - n is eNB-configurable in the range { 2,3,4} or it is pre-configured to 4.
- PS UEs are required to be able to simultaneously track at least 3 different D2D synchronization references on a given carrier
- The PS UE should monitor the SA pool associated to each of the detected synchronization references
- In case the number of detected synchronization references exceeds the UE capability, the synchronization references with highest received power or from eNB are prioritized.

Decision: The document is noted.

R1-142661	WF on Triggering Condition(s) of D2DSS Transmission	Samsung, Nokia, NSN, Intel	

Decision: The document is noted.
Proposal:

- For **in-coverage UEs**,
  - eNB can explicitly configure D2DSS transmission based on UE request.
  - The following conditions can be configured by eNB for D2DSS transmission:
    - Proactive Approach:
      - RSRP from the eNB is below X dBm.
      - Received power of detected D2DSS in D2DSSue_net is below Y dBm.
    - Reactive Approach:
      - Received power of detected D2DSS in D2DSSue_oon exceeds Z dBm.
  - FFS if different values of X, Y, or Z are used.
  - D2DSS is used for received power measurements.
    - FFS if PD2DSCH is used.
  - Other criteria are not precluded.
- For **out-of-coverage UEs with TX timing reference derived from eNB** can be triggered for D2DSS transmission when at least one of the following conditions is met:
  - Received power of detected D2DSS in D2DSSue_oon exceeds Z dBm.
  - Received power of detected D2DSS in D2DSSue_net is below Y dBm.
  - FFS if different values of Y or Z are used.
  - D2DSS is used for received power measurements.
    - FFS if PD2DSCH is used.
  - Other criteria are not precluded.

Continue discussion until RAN1#78.

R1-142662	WF on Selection and Reselection of Synchronization Source	Samsung, LGE	

Decision: The document is noted.
Proposal:

- Selection and Reselection is performed in periodic scanning time.
  - All UEs synchronized to the synchronization source scan possible unsynchronized D2DSSs during same scanning time.
    - The UEs do not transmit D2D signals/channels other than their own D2DSS/PD2DSCH during the scanning time.
    - The time duration for scanning is larger than a D2DSS period.
  - The timing for scanning is informed in Time-to-Scan (TTS).
  - TTS is indicated by Synchronization Source UE via PD2DSCH.
    - FFS TTS signaling details

Question: whether to specify a D2D-silent period which is a multiple of the D2DSS period length to assist UEs with scanning for other synchronization sources for out-of-coverage UEs?

- yes: Samsung, LGE, Intel
- no: CATT
- FFS: Sharp, QC, GDB, .. many

Conclusion: continue to study until RAN1#78.

Inter-cell D2D

R1-142624	WF on D2D Transmission Timing for Communication	Qualcomm Incorporated, ZTE, Kyocera, III	

The document was presented by Saurabha Tavildar from Qualcomm.

- For in-coverage UEs
  - SA uses DL Timing
  - For Mode 2, Data uses DL Timing
  - For Mode 1, Data timing uses UL Timing
  - DL timing := T2 = 0 (FDD) and T2 = $624T_S$ (TDD)
- UL Timing := TA + DL timing

Discussion: Huawei questionned the rational using DL timing for SA.
Decision: The document is noted, modified and agreed as follows:

Agreements:

- For in-coverage UEs

- SA uses DL Timing
- For Mode 1, Data timing uses UL Timing
- For Mode 2, FFS: Data uses DL Timing or UL Timing
- DL timing := T2 = 0 (FDD) and T2 = $624T_S$ (TDD)

- UL Timing := TA + DL timing

R1-142628	WF on D2D synchronization source for partial coverage	LG Electronics, Huawei, HiSilicon	

The document was presented by Ms Hyangsun You from LGE.

- The set of D2DSS that can be transmitted by a UE is divided into two groups:
  - D2DSSue_net: A set of D2DSS(s) transmitted by UE when the synchronization source is derived from eNB.
  - D2DSSue_oon: A set of D2DSS(s) transmitted by UE when the synchronization source not derived from eNB.
- For UEs that detected PSS/SSS
  - If a UE detects a D2DSS in D2DSSue_oon and it can be connected to an eNB, it can report the detection to the eNB. The eNB may then instruct the UE to transmit a D2DSS from D2DSSue_net
- For UEs not detected PSS/SSS
  - A UE cannot transmit a D2DSS in D2DSSue_net if no D2DSS in D2DSSue_net is detected.
  - A UE can transmit a D2DSS in D2DSSue_net if
    - It detects the D2DSS and is synchronized to it, and
    - The stratum level of the detected D2DSS is lower than a threshold.

Decision: The document is noted.

Possible agreements:

- The set of D2DSS that can be transmitted by a UE is divided into two groups:
  - D2DSSue_net: A set of D2DSS sequence(s) transmitted by UE when the synchronization source is derived from eNB
  - D2DSSue_oon: A set of D2DSS sequence(s) transmitted by UE when the synchronization source not derived from eNB

Possible agreements:

- For UEs that detected PSS/SSS
  - If a UE detects a D2DSS in D2DSSue_oon and it can be connected to an eNB, it can report the detection to the eNB. The eNB may then instruct the UE to transmit a D2DSS from D2DSSue_net
    - Qualcomm: What is UE procedure of D2DSS detection in out of coverage?
- For UEs not detected PSS/SSS
  - A UE cannot transmit a D2DSS in D2DSSue_net if no D2DSS in D2DSSue_net is detected.
  - A UE can transmit a D2DSS in D2DSSue_net if
    - It detects the D2DSS and is synchronized to it, and
    - The stratum level of the detected D2DSS is lower than a threshold.

Continue offline discussion in the coffee break – (LGE)

Tuesday evening

Ericsson → still have concern with the wording "sequence(s)"

Agreements:

- The set of D2DSS that can be transmitted by a UE is divided into two groups:
  - D2DSSue_net: A set of D2DSS sequence(s) transmitted by UE when the transmission timing reference is an eNB
  - D2DSSue_oon: A set of D2DSS sequence(s) transmitted by UE when the transmission timing reference is not an eNB
    - FFS: If multi-hop is supported
  - When UE is out of coverage and detected a D2DSS in D2DSSue_net,
    - FFS: whether UE transmits a D2DSS in D2DSSue_net or in D2DSSue_oon or neither

Continue offline discussion on remaining possible agreements until Wednesday – LGE

R1-142664	Proposal from offline discussion on D2D synchronization	LG Electronics	

Decision: The document is noted.

Proposed Agreement:

- Alt1: When UE is out of coverage and detected a D2DSS whose sequence is in D2DSSue_net,
  - If the UE selects the detected D2DSS whose sequence is in D2DSSue_net as the timing reference for its transmissions, it transmits a D2DSS whose sequence is in D2DSSue_net as its timing reference if it becomes a D2D synchronization source.

- FFS whether it transmits the same D2DSS, in which case a hop count is carried in the PD2DSCH
- If the UE does not select the detected D2DSS whose sequence is in D2DSSue_net as the timing reference for its transmissions, it transmits a D2DSS whose sequence is in D2DSS_ue_oon if it becomes a D2D synchronization source.

- Alt2: When UE is out of coverage and detected a D2DSS whose sequence is in D2DSSue_net, it transmits a D2DSS whose sequence is in D2DSS_ue_oon if it becomes a D2D synchronization source.

Continue discussion until RAN1#78, and also consider what is meant by out of coverage in this context.

Not treated.

R1-141925	D2D synchronization procedure for out-of-coverage	Huawei, HiSilicon	
R1-141926	D2D synchronization procedure for in-coverage	Huawei, HiSilicon	
R1-142008	Discussion on D2D synchronization source	CATT	
R1-142022	Synchronization Procedure for D2D Communication	Intel Corporation	
R1-142062	D2D Synchronization Procedure	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-142076	Discussion on D2D Synchronization Procedure	Fujitsu	
R1-142121	D2D synchronization procedure for partial network coverage	Samsung	
R1-142122	D2D synchronization procedure for out-of-network coverage	Samsung	
R1-142123	Synchronization source UE determination for in-coverage scenario	Samsung	
R1-142159	Discussion on procedures for D2DSS transmission and reception	LG Electronics	
R1-142160	Discussion on D2D signal transmission and reception timing	LG Electronics	
R1-142161	Considerations on supporting inter-cell D2D operations	LG Electronics	
R1-142174	D2D synchronization procedure for out-of-network coverage	NEC	
R1-142192	Rough synchronization procedure in D2D	Panasonic	(R1-141220)
R1-142270	Views on inter-cell and inter-carrier D2D	NTT DOCOMO	
R1-142292	D2D Synchronization procedure for in and out of coverage UEs	HTC	
R1-142317	Analysis of Multi-hop Synchronization Procedures with Prioritized Hop Count	Intel Corporation	
R1-142453	Synchronization procedure for D2D communication and discovery	Nokia, NSN	
R1-142475	Synchronisation design for D2D communication and discovery	Sony	
R1-142489	Synchronization procedure	Kyocera	
R1-142753	WF on Type 2B Transmission Timing	Qualcomm Incorporated, DoCoMo, Intel, General Dynamics	

6.2.5.3.4 Other

Not treated.

R1-142238	Timing and synchronization for D2D Discovery/communication	ZTE	

6.2.5.4 Other

Rapporteur to compile a spreadsheet of the RRC parameters needed for D2D according to the agreements and working assumptions reached so far, and a draft LS to accompany it.
For email approval until Friday 31st July – Shailesh (QC)

Not treated.

R1-142124	Multi-carrier operations for D2D and WAN transmission/reception	Samsung	
R1-142316	Discussion on D2D Multicarrier Capabilities	Intel Corporation	
R1-142361	Coexistence issues between D2D discovery and WAN	CATR	
R1-142454	WAN protection by configurable D2D transmission power control	NSN, Nokia	

6.2.6 Network Assistance Interference Cancellation and Suppression for LTE

WID in RP-140519.

R1-142684	LS on NAICS Parameters	RAN4, Qualcomm	= R4-143847

The document was presented by Satoshi Nagata on behalf of Qualcomm and provides RAN4 latest decisions w.r.t NAICS parameters from complexity and performance benefits point of view.
Decision: The document is noted.

6.2.6.1 Higher-layer signalling

R1-142322	NAICS functionality, robustness, and configurability	Ericsson	

The document was presented by Mark Harrison from Ericsson and proposes:

- Two distinct NAICS capabilities are defined
  - The UE is capable of PDSCH mitigation and CRS-IC in all subframes
  - The UE is capable of CRS-IC in all subframes
- NAICS UEs can support Rel-11 CRS-IC
  - CRS-IC functionality is supported both when one and two CSI subframe sets are configured.
- NAICS functionality applies when one or more semi-statically provided assistance parameters are not valid in a given subframe.
  - Such functionality can be supported e.g. by decoding using both NAICS and Rel-11 receivers
- Assistance parameters for NAICS PDSCH interference mitigation and for CRS-IC can be provided independently
  - NAICS UEs that support PDSCH interference mitigation and CRS-IC in all subframes can be assumed to support CRS-IC if PDSCH mitigation is not active.
- 'On/off' control of whether NAICS functionalities are enabled (or to indicate conditions are favorable for NAICS) is supported
  - A low overhead 'on/off' indication is signaled.
  - At least UEs that require assistance information support on/off
  - It is FFS if 'on/off' of CRS-IC is needed.
  - FFS if a NAICS UE not requiring assistance can indicate if NAICs is 'on' and/or supports 'on/off'
- If all NAICS UEs cannot be assumed to support NAICS when one or more semi-statically provided assistance parameters are not valid in a given subframe,
  - The network is aware of such UEs, e.g. through capability signaling
  - Such UEs support NAICS 'on/off' control

Decision: The document is noted.

R1-142303	Higher-layer signaling of interference parameters for NAICS	MediaTek Inc.	

The document was presented by Jeff Zhuang from MediaTek and proposes:

- Proposal 1: RAN1 can conclude that cell ID will be included as part of the cell-specific higher layer signaling. When NAICS signaling is present, synchronization of CP, slot, SFN, subframe and common system bandwidth for the serving cell and interfering cells can be implicitly assumed at the UE.
- Proposal 2: Rel-12 NAICS can follow Rel-11 design where CRS ports and MBSFN pattern can be higher-layer signaled to avoid detection complexity and false/missed detection of MBSFN subframes.
- Proposal 3: Define RRC signaling to indicate that LVRB is used, or the UE can implicitly assume so when NAICS signaling is present.
- Proposal 4: P_B should be RRC signaled.
- Proposal 5: Consider [-6, -3, 0, 3] as the P_A subset. A single P_A value, if acceptable to the network, may also be signaled to help remove the significant performance loss of blind detection.
- Proposal 6: TM subset restriction can be signaled optionally by eNB. Consider the definition of at least three subset restrictions:
  - TM2 (TxD) and TM3 (large delay CDD + TxD)
  - TM4 (rank 1 or 2 with PMI) with TM6 (rank-1) as the degenerated case, where TxD can still be used as a fall-back scheme.
  - TM8/9/10 (rank-1 or 2) where TxD can be used as a fallback scheme.
- Proposal 7: As an option of the network, configuration information for all the CSI-RS (ports and offset/periodicity and N_{ID}^{CSI} if configured) can be higher-layer signaled to the UEs. UE should not be required to detect CSI-RS configuration (both NZP and ZP CSI-RS) in the absence of signaling.
- Proposal 8: At eNB's discretion, QCL information may or may not be signaled via higher layer signaling.
- Proposal 9: A subset of virtual cell ID should be signaled in case of TM10. The exact size of the subset may not need to be defined in the spec, but a starting point to consider in practice or test definition is 2 virtual cell IDs, similar to the two nSCID values allowed in TM9.

- Proposal 10: As an eNB option, CFI of each cell can be provided in higher layer by the serving cell when fixing the CFI is deemed acceptable given the scheduling constraint.

Decision: The document is noted.

R1-142456	On NAICS signalling operation	NSN, Nokia	

The document was presented by Mihai Enescu from NSN and is summarized as follows:

- The NAICS UE may experience different dominant interferers at the same time.
  - The dominant interferer may change the point of origin in time.
  - The border region when two dominant interferers are changed needs to be covered by NAICS network assistance.
- A proactive type of network assistance ensures seamless network assistance at the UE.
- A solution based on network assistance of multiple dominant interferers and blind detection is desirable.
- Network assistance of UE specific interference characteristics is impractical for higher layer signalling.
- Dynamic signalling preserves the network flexibility and allows for fine detail network assistance.
- RSRP is one accessible option for network assistance request.

Decision: The document is noted.

WFs

R1-142681	WF on higher layer signaling for NAICS	NTT DOCOMO, Huawei, HiSilicon, LGE, MediaTek, Nvidia, Qualcomm, Samsung, Verizon, CMCC, Broadcom	

The document was presented by Kazuaki Takeda from NTT DOCOMO.

- The following parameters of interfering cells are signaled by higher layer
  - Cell ID, CRS ports, MBSFN pattern, and P_B
  - Restricted subset of virtual cell ID for TM10
    - Subset size of virtual cell ID is FFS
  - Restricted subset of P_A
    - Subset size of P_A at most 3 (baseline) or 4 values
    - P_A values should apply to QPSK PDSCH transmissions for both serving cell and interfering cell
  - Supported TM(s)
  - Zero power and non-zero power CSI-RS configuration
  - QCL
  - [PDSCH starting position for TM10]
    - This signalling does not imply any restriction at the eNodeB
- Synchronization of CP, slot, SFN, subframe and common system bandwidth for the serving cell and interfering cells are not signaled.
  - Synchronization of those parameters can be implicitly assumed at the UE when any higher layer signaling for NAICS is present
- UEs can assume the interference PDSCH resource allocation is at least 1 PRB pair when higher layer signaling for NAICS is present.
  - A larger interferer parameters granularity in frequency (resource allocation and precoding granularity) can be signaled to UE without any impact on scheduling in the network
- Network assistance for multiple interfering cells can be configured as necessary.
  - Number of interfering cells is FFS

Discussion: Ericsson → mechanism on MBSFN pattern/CRS ports signaling is unclear?
Ericsson→ questioned whether "Subset size of virtual cell ID is FFS" is aligned with RAN2 agreements – NTT DOCOMO preference is on maximum value (reason for FFS)
Intel→ concern with restricted subset of cell ID – nSCID to be considered
Ericsson→ P_A values restricted to only QPSK – may need to be extended
NSN→ signaling of supported TMs is not needed
Decision: The document is noted, modified and agreed as follows:

Agreements:

- The following parameters of interfering cells are signaled by higher layer
  - Cell ID, P_B
  - CRS ports, i.e., 1, 2, and 4
  - MBSFN pattern
  - Restricted subset of combination of virtual cell ID and nSCID for TM10
    - Maximum subset size of combination of virtual cell ID and nSCID is in the range from 6 to 12, but number of blind detection in a subframe may be less than maximum subset size of combination of virtual cell ID and nSCID
  - Restricted subset of P_A
    - Subset size of P_A at most 3 (baseline) or 4 values

- Synchronization of CP, slot, SFN, subframe and common system bandwidth for the serving cell and interfering cells are not signaled
  - Synchronization of those parameters can be implicitly assumed at the UE when any higher layer signaling for NAICS is present
- UEs can assume the interference PDSCH resource allocation is at least 1 PRB pair when higher layer signaling for NAICS is present
  - A larger interferer parameters granularity in frequency (resource allocation and precoding granularity) can be signaled to UE without any impact on scheduling in the network
- FFS: Scheduler/Signaling flexibility

Possible agreements:

- The following parameters of interfering cells are signaled by higher layer
  - Restricted subset of P_A
    - P_A values should apply to QPSK PDSCH transmissions for both serving cell and interfering cell, extended P_A values is FFS
  - Supported TM(s)
  - Zero power and non-zero power CSI-RS configuration
    - Nokia, NSN, AL, Ericsson: No need
  - QCL
    - Nokia, NSN, AL, NEC, ZTE, Ericsson: No need
  - [PDSCH starting position for TM10]
    - This signalling does not imply any restriction at the eNodeB
      - Nokia, NSN, AL, Ericsson: No need
      - Intel: Want signalling for all TMs
  - TDD UL/DL configuration of interfering cells
- Above higher layer signalling is provided by per cell basis
- Network assistance for multiple interfering cells can be configured as necessary
  - Number of interfering cells is FFS

Continue offline discussion until Thursday morning – (Mediatek)

R1-142683	WF on NAICS Support for 4 Tx Antenna Ports	Ericsson, NSN, Nokia, Alcatel Lucent, Alcatel Lucent Shanghai Bell, CATT, Sprint	

The document was presented by Mark Harrison from Ericsson.

- NAICS functionality supports 1, 2, and 4 CRS ports
  - Including mixed CRS port deployments, i.e. different number of CRS ports for different cells
- Assistance signaling can indicate the UE may assume that TM 3, 4, 9, and 10 PDSCHs have at most 2 spatially multiplexed layers
    - This does not preclude a UE from assuming a PDSCH uses 4 layer spatial diversity
- NAICS precoding matrix assistance signaling is not precluded
  - If specified, NAICS precoding matrix assistance signaling will allow reduced UE blind decoding complexity

Decision: The document is noted. Continue offline discussion until Thursday morning.

R1-142175	Signaling Considerations for NAICS	NEC	

Decision: The document is noted.

R1-142010	Further consideration on higher-layer signalling for NAICS receiver	CATT	

Decision: The document is noted.

Thursday 22nd

R1-142696	Conclusion from NAICS offline discussion	MediaTek Inc.	

The document was presented by Jeff Zhuang from MediaTek and shows the agreements reached in the offline session.
Discussion: Still left the CSI-RS signaling
Concern from NSN with bullet "TM(s) or transmission schemes (TS)" → some guidance to RAN2 is needed
Decision: The document is noted, modified and agreed as follows:

Agreements:

- The following parameters of interfering cells are signaled by higher layer
  - Restricted subset of P_A
    - Data RE to RS power offset values should apply to QPSK PDSCH transmissions
      - The exact values of P_A will be determined until RAN1#78, including existing values and possible new values

  - Working assumption: TM(s) used in eNB
    - "x" bits to represent supported TMs, i.e., TM1, TM2 (a "fallback" mode),TM3,TM4,TM6,TM8,TM9,TM10
  - FFS: QCL
  - FFS: Zero power and non-zero power CSI-RS configuration (Optionally provided by eNB)
  - FFS: PDSCH starting position
  - FFS: TDD UL/DL configuration of interfering cells
- FFS: How to associate the above higher layer signalling with a cell ID or other parameters (e.g., virtual cell ID, nSCID)
- Network assistance signalling from serving eNB can be provided to UEs without any new NAICS-specific report/trigger from a UE
  - FFS: Network assistance signalling from serving eNB can be provided to UEs with new NAICS-specific trigger, and if so the triggering event/condition
- RAN1 will continue the discussion whether to support of 4 CRS APs based CRS-based TMs and whether NAICS precoding matrix assistance signalling may be needed in this case.
- Prepare draft LS (R1-142702) to RAN2, RAN4 (and cc: RAN3) until Friday morning – (Mediatek)
  - Indicate RAN2 that some companies prefer to use "transmission scheme(s)" as an alternative higher layer signalling to "TM(s)"

Email discussion/approval until 24th June for above FFS parts, P_A , and additional LS to RAN2 – Jeff (Mediatek)

Friday 23rd

R1-142702	LS on NAICS High Layer Signaling	MediaTek Inc.	

The document was presented by Jeff Zhuang from mediaTek.

Discussion: Following comment from Ericsson has not been captured in the LS:

- *RAN1 will continue to consider the system impact of higher-layer signaling and network coordination, including signaling overhead and the performance impact of any scheduling restriction due to subset restriction, and will update RAN2 and RAN4 if issues requiring updates to NAICS higher-layer signaling are identified.*

Decision: The document is noted and agreed as it is.

In addition, above email discussion topics are further clarified as follows:

Email discussion/approval until 24th June for above FFS parts, maximum subset size of P_A, maximum subset size of combination of virtual cell ID and nSCID, and additional LS to RAN2 – Jeff (Mediatek)

Not treated.

R1-141946	Discussion on network assistance signalling parameters	Huawei, HiSilicon	
R1-141977	Network assistance signaling	Qualcomm Inc.	
R1-142014	Discussion on higher layer signaling for NAICS	Intel Corporation	
R1-142063	Considerations on higher-layer signalling for NAICS	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-142125	Discussion on higher-layer signalling for NAICS	Samsung	
R1-142126	Remaining details on transmission parameters for NAICS	Samsung	
R1-142162	Discussion on higher-layer signalling for NAICS	LG Electronics	
R1-142193	Relationship between higher-layer signaling restriction and blind detection	Panasonic	
R1-142219	Consideration on the remaining issues about higher-layer signalling	ZTE	
R1-142246	Discussion on High-Layer Signalling for NAICS	ITRI	
R1-142271	Remaining issues on higher layer signaling for NAICS	NTT DOCOMO	
R1-142283	Higher-layer signaling for NAICS	Broadcom Corporation	
R1-142321	4 CRS Port Specification Impact and Performance for NAICS	Ericsson	
R1-142323	Higher Layer Signaling of TM10 DMRS Properties for NAICS	Ericsson	
R1-142363	Consideration on higher layer signalling of NAIC	CATR	
R1-142455	Network assistance for NAICS receivers	NSN, Nokia	
R1-142510	Discussion on NAICS signaling and operation	CMCC	
R1-142571	Higher-layer signaling for NAICS	Ericsson	(R1-142320)
R1-142588	Remaining aspects of higher-layer signaling for NAICS	NVIDIA	(R1-142312)

6.2.6.2 CSI enhancement

R1-142682	WF on CSI enhancement for NAICS	NTT DOCOMO, ALU, ASB, Huawei, HiSilicon, LGE, MediaTek, Qualcomm, Samsung, Verizon, CMCC	

The document was presented by Kazuaki Takeda from NTT DOCOMO.

- Observation: the following CSI enhancement for NAICS were proposed.
  - Extending CSI reference resource definition to the resource allocation of the scheduled PDSCH
  - Additional feedback to assist the network with assessing the benefit of network assistance signaling and making reconfigurations to NAICS UE.
  - NAICS CQI with a fixed modulation assumption of interference signal
  - Aperiodic CSI-IMR configuration
  - Configuration of interference averaging interval for CSI calculation by network side
  - NAICS CSI calculated based on interference observed over a CSI-IM
  - Multiple CSI feedback assuming different receiver type
  - Modification of CQI definition
- Among the above proposals, consensus on the benefits of CSI enhancement has not been yet reached
- Proposal: In Rel-12, there is no change to the current CQI definition for NAICS CSI reporting.
  - Note that the UE would take into account any NAICS gains into the CQI derivation depending on UE implementation and it is up to RAN4 whether a new test case is required.

Discussion: Number of companies (NVIDIA, Ericsson,…) could not agree on this WF
Mr Chair: let's look at some of the contributions
Decision: The document is noted.

R1-142313	Specifying CQI for NAICS	NVIDIA	

The document was presented by Tommi Koivisto from NVDIA and proposes to enable the UE to capture the NAICS demodulation gains into the CSI report.

- I.e. to specify NAICS CSI enhancements.

If consensus cannot be reached on CSI feedback enhancements for NAICS, specify that the UE shall not take network assistance information into account in CSI feedback calculation.
Decision: The document is noted.

R1-142324	On CSI enhancements for NAICS	Ericsson	

The document was presented by Lars Lindbom from Ericsson and draws the following observations:
Observation 1:

- Pre-NAICS CSI reporting violates current CQI definition
- Post-NAICS CSI reporting for TM1-9 increases CSI computation complexity significantly when CSI reference resource do not overlap with UE's own scheduled PDSCH
  - High risk for inconsistent UE behavior between subframes carrying own PDSCH and those that does not

Observation 2: The existing Rel-11 CoMP CSI concept of injecting interference hypotheses onto CSI-IM from network side precludes the use of post-NAICS CSI reporting for TM10
Observation 3:

- Pre-NAICS CSI reporting provides a chance for consistent UE behavior
  - CQI can no longer be mandated to *directly* correspond to demodulation performance
- Modifications to the CQI definition are inevitable

Observation 4:

- A unified pre-NAICS CSI CQI definition specification text is possible if
  - the term CSI-IM is interpreted to correspond to CRS REs for TM1-9
  - TM1-9 are considered to have one CSI process
- Such a unified CQI definition brings the added benefit of fostering consistent UE behavior via proper specification of interference measurement resources also for TM1-9

Decision: The document is noted.

It is observed that, among the above proposals, there is no consensus on the benefits of CSI enhancement.

Agreement

- No RAN2 impact by NAICS CSI enhancement.

Not treated.

R1-141978	CSI measurement and reporting for NAICS	Qualcomm Inc.	
R1-142011	On CSI enhancement for NAICS receiver	CATT	
R1-142015	Discussion on CQI enhancement for NAICS	Intel Corporation	
R1-142064	CSI enhancement for NAICS	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

R1-142127	Discussion on CSI enhancement options for NAICS	Samsung	
R1-142163	Discussion on CSI enhancement for NAICS	LG Electronics	
R1-142220	Evaluation results of CSI enhancements for NAICS	ZTE	
R1-142272	Evaluation results of CSI enhancements for NAICS	NTT DOCOMO	
R1-142284	CSI Enhancements for NAICS	Broadcom Corporation	
R1-142304	Discussion on CSI feedback for NAICS receivers	MediaTek Inc.	
R1-142314	On CSI feedback enhancements in support of NAICS	NVIDIA	
R1-142341	Discussion on CSI enhancement for NAICS	Huawei, HiSilicon	
R1-142349	On CSI Enhancement for NAICS	InterDigital	
R1-142457	On NAICS CSI feedback	NSN, Nokia	
R1-142511	Discussion on CSI feedback for NAICS receivers	CMCC	

7 Closing of the meeting

Mr Chair expressed his thanks to the RAN1 Vice Chairmen, as well as Carmela Cozzo and Karri Ranta-aho for chairing parallel HSPA sessions.

Thanks to the host, LGE, for organizing and providing the facilities.

Mr Chair wished a safe journey back home to all and closed the meeting at 17:10.
See you all in Dresden

Annex A: List of Tdocs at RAN1 #77

Please see excel file attached to this report

Annex B: List of CRs agreed at RAN1 #77

TS	CR	Rev	Rel	Title	Cat	Vsn	TD#	Source to WG	Work Item	Clauses affected
36.213	0460	-	Rel-11	Clarification on SRS colliding with PUCCH in the same cell when the UE is configured with multiple TAGs	F	11.6.0	R1-142585	Qualcomm Inc., Fujitsu	LTE-Phys, TEI11	8.2
36.213	0461	-	Rel-12	Clarification on SRS colliding with PUCCH in the same cell when the UE is configured with multiple TAGs	A	12.1.0	R1-142586	Qualcomm Inc., Fujitsu	LTE-Phys, TEI12	8.2
25.214	0717	1	Rel-11	Compressed mode in Multiflow assisting (secondary) serving cell	F	11.8.0	R1-142604	NSN	HSDPA_MFTX-Core	6A.3
25.701	008	-	Rel-12	Update of the TR based on agreements done on RAN1#77 meeting	B	12.1.0	R1-142612	NSN	FS_UTRA_SCAL	
25.214	0719	1	Rel-11	Clarification of the power scaling for MIMO dual transport block transmission	F	11.8.0	R1-142706	Huawei, HiSilicon	MIMO_64QAM_HSUPA	5.1.2.6
25.214	0718	1	Rel-11	Correction of DRX operation for Multiflow	F	11.8.0	R1-142711	Huawei, HiSilicon	HSDPA_MFTX-Core	6C.3.1
25.211	0317	-	Rel-11	Correction of DRX operation for Multiflow	F	11.4.0	R1-142712	Huawei, HiSilicon	HSDPA_MFTX-Core	7.7.2
25.214	0716	2	Rel-11	Clarifications to Multiflow Operation	F	11.8.0	R1-142713	Qualcomm Incorporated, NSN, Huawei, Ericsson	HSDPA_MFTX-Core	4.2.5, 6A.1, 6C
36.211	0190	1	Rel-12	Clarification of downlink subframes	F	12.0.0	R1-142724	Ericsson	LTE-Phys	4.2, 5.5.3.2, 6.7.4, 6.9, 6.10, 6.10.4.3, 6.10.5.2
36.212	0159	-	Rel-12	Clarification of downlink subframes	F	12.0.0	R1-142765	Huawei, HiSilicon	LTE_Phys	5.2.2.6, 5.2.3.1
36.212	0160	-	Rel-11	Clarification on determination on soft buffer size	D	11.4.0	R1-142766	Huawei, HiSilicon	LTE_Phys	5.1.4.1.2
36.213	0462	1	Rel-12	Clarification on SRS antenna switching	F	12.1.0	R1-142770	Qualcomm Inc.	LTE-Phys, TEI12	8.2, 8.7
36.211	0191	-	Rel-12	Inclusion of eIMTA, TDD-FDD CA, and coverage enhancements	B	12.1.0	R1-142771	Ericsson	LTE_TDD_eIMTA Cov_Enh_LTE LTE_CA_TDD_FDD	4, 4.2, 5.5.3.3, 6.9, 8
36.212	0158	-	Rel-12	Introduction of Rel 12 features of TDD-FDD CA and eIMTA	B	12.0.0	R1-142772	Huawei	LTE_CA_TDD_FDD-Core, LTE_TDD_eIMTA	5.1.4.1.2, 5.2.2.6, 5.2.2.6.2, 5.2.2.6.5, 5.2.3.1, 5.3.3.1.1, 5.3.3.1.2, 5.3.3.1.3, 5.3.3.1.3A, 5.3.3.1.4, 5.3.3.1.4A, 5.3.3.1.5, 5.3.3.1.5A, 5.3.3.1.5B, 5.3.3.1.5C, 5.3.3.1.5D, 5.3.3.1.8
36.213	0463	-	Rel-12	Introduction of Rel-12 LTE-Advanced features in 36.213	B	12.1.0	R1-142773	Editor (Motorola Mobility)	LTE_TDD_eIMTA Cov_Enh_LTE LTE_CA_TDD_FDD	4.2.3, 5.1.1.1, 5.1.2.1, 5.1.3.1, 6.2, 7, 7.1, 7.1.8, 7.2, 7.2.1, 7.2.2, 7.2.3,

TS	CR	Rev	Rel	Title	Cat	Vsn	TD#	Source to WG	Work Item	Clauses affected
										7.2.5, 7.2.6, 7.2.7, 7.3, 7.3.2, 7.3.2.2, 7.3.3, 7.3.4, 8, 8.0, 8.2, 8.3, 8.6.1, 8.6.3, 9.1.2, 10.1, 10.1.1, 10.1.2.2.1,10.1.2.2.2, 10.1.2A, 10.1.3, 10.1.3.1, 10.1.3.2, 10.1.3.2.1, 10.1.3.2.2, 10.1.3A,10.2, 13, 13.1

Annex C-1: List of Outgoing LSs from RAN1 #77

R1	Response to (Ic LS)	To	Cc	Title	Contact	Ref'd /Attachd Tdoc	Release	WI
R1-142613		R2, R3		LS on interference management techniques in Hetnet	Huawei		Rel-12	UTRA_hetnet_enh
R1-142614	R2-141785	R2, R3		RAN1 response to LS on RAN2 agreements and working assumptions on E-DCH decoupling	NSN		Rel-12	UTRA_hetnet_enh-Core
R1-142616		R2, R3		LS on HS-DPCCH overhead reduction	Huawei		Rel-12	EDCH_enh
R1-142617		R2, R3, R4		LS on Further EUL Enhancements	Ericsson		Rel-12	EDCH_enh
R1-142618		R2, R3	R4	LS on Progress in RAN1 #77 for the UMTS Heterogeneous Networks Enhancements WI	Huawei		Rel-12	UTRA_hetnet_enh
R1-142652		R2, R4, S2		LS on D2D Multicarrier Capabilities	Ericsson		Rel-12	LTE_D2D_Prox-Core
R1-142686		R2		Reply LS on DL-SCH Soft Channel Bits in Dual-Connectivity	Ericsson		Rel-12	LTE_SC_enh_dualC
R1-142698		R2, R4		LS on small cell discovery signal	NTT DoCoMo		Rel-12	LTE_SC_enh_L1
R1-142702		R2, R4	R3	LS on NAICS High Layer Signaling	MediaTek		Rel-12	LTE_NAICS
R1-142708		R2, R3, R4		LS on RAN1 Decisions for Enhanced DCH Work Item	Qualcomm		Rel-12	UTRA_DCHenh
R1-142709		R2, R3		Response LS on TTI switching indication	Qualcomm		Rel-12	EDCH_enh
R1-142733		R2, R4		LS on discovery signal details	LGE		Rel-12	LTE_SC_enh_L1
R1-142745		R2		LS to RAN2 on 36.306 for low cost MTC UE	HiSilicon		Rel-12	LC_MTC_LTE-core
R1-142750		R2		LS on simultaneous reception of low complexity Ues	Vodafone		Rel-12	LC_MTC_LTE-core
R1-142755		R2, R3, R4		LS on RAN1 agreements on Physical layer functionalities required for operation of Dual Connectivity in RAN1#77	NTT DoCoMo		Rel-12	LTE_SC_enh_dualC
R1-142762		R3	RAN, S5	LS on radio interface based synchronization	Huawei		Rel-12	LTE_SC_enh_L1
R1-142767		R2, R4		LS on 256QAM	Huawei		Rel-12	LTE_SC_enh_L1
R1-142768		R2		LS on the support of TDD/FDD CA in Dual Connectivity	Huawei		Rel-12	LTE_SC_enh_dualC
R1-142769		R2		LS on the support of PUCCH on two serving cells in CA	Huawei		Rel-12	LTE_SC_enh_dualC
R1-142748		R2, R3, S2	R4	LS on eNB knowledge of low complexity UEs	Ericsson		Rel-12	LC_MTC_LTE-core

R1-142775		R2, R4		LS on RAN1 agreements on DRS design	LGE		Rel-12	LTE_SC_enh_L1
R1-142777		R2	R3, R4	LS on updated LTE Rel-12 UE feature list	NTT DoCoMo	R1-142774	Rel-12	-
R1-142784		R2		LS on Maximum Number of Transport Block Bits in Dual-Connectivity	Ericsson		Rel-12	LTE_SC_enh_dualC
R1-142787		R2		LS on RRC parameters for ProSe LTE D2D	Qualcomm		Rel-12	LTE_D2D_Prox-Core

Annex C-2: List of Incoming LSs from RAN1 #77

Source	Original Tdoc nbr	RAN1 Tdoc nbr	To	Cc	Title	Response to (Ic LS)	Release	WI	Contact
R2	= R2-141785	R1-141902	R1	R3	LS on RAN2 agreements and working assumptions on E-DCH decoupling		Rel-12	UTRA_hetnet_enh-Core	NSN
R2	= R2-141786	R1-141903	R1	R3	LS on DCH enhancements		Rel-12	UTRA_DCHenh-Core	Qualcomm
R2	= R2-141787	R1-141904	R1		LS on TTI switching indication from UE		Rel-12	EDCH_enh-Core	Ericsson
R2	= R2-141789	R1-141905	R3	R1	LS on TTI switching		Rel-12	EDCH_enh-Core	Ericsson
R2	= R2-141836	R1-141906	R1		Reply LS on identifier in scheduling assignment for D2D communication	R1-141813 (R2-141830)	Rel-12	LTE_D2D_Prox-Core	Ericsson
R2	= R2-141848	R1-141907	R1		LS on prioritizing MCG uplink transmission	R1-141007 (R2-140958)	Rel-12	LTE_SC_enh_dualC-Core	Samsung
R2	= R2-141849	R1-141908	R3, R4	R1	LS on SFN handling in the dual connectivity		Rel-12	LTE_SC_enh_dualC-Core	Samsung
R2	= R2-141851	R1-141909	R4	R1	LS on Activation/deactivation for Dual Connectivity		Rel-12	Dual Connectivity for LTE	NSN
R2	= R2-141852	R1-141910	R1		Reply LS on subframe #6 in LTE_TDD_eIMTA	R1-141025	Rel-12	LTE_TDD_eIMTA-Core	CATT
R3	= R3-140947	R1-141911	R1	R2	Reply LS on Identification of TBS/bandwidth limited UE by eNB	R1-141033 (R3-140501)	Rel-12	LC_MTC_LTE-core	Huawei
R3	= R3-140950	R1-141912	S2	R2, R1, S1, S4, C4, C1	Reply LS on GCSE QCIs and connected mode DRX	S2-140846 (R3-140510)	Rel-12	GCSE_LTE	Samsung
R3	= R3-140951	R1-141913	NGMN BoD, NGMN Project RAN Evolution	RAN, R1	Reply LS on consolidated operator view on eCoMP standardization	140313 (R3-140512)	Rel-12	COMP_LTE_IeNB	Samsung
R4	= R4-142358	R1-141914	R2	R1	LS on maxumum relative propagation delay difference among the component carriers in intra-band non-contiguous CA		Rel-11	LTE_CA_enh-Perf	NTT DoCoMo
R4	= R4-142526	R1-141915	R1	R2, G1, G2	LS on defining the new RSRQ measurements definition		Rel-12	TEI12	Nokia

Source	Original Tdoc nbr	RAN1 Tdoc nbr	To	Cc	Title	Response to (Ic LS)	Release	WI	Contact
S3	= S3-140566	R1-141916	R2, R1		LS on parameter synchronization	R1-140941	Rel-12	LTE_D2D_Prox	Qualcomm
S3-LI	= SA3LI14_077r2	R1-142240	RAN, S2, S3, S5	R1, R2, R3, SA, S1	Reply LS on ProSe Lawful Interception	RP-132107 (SA3LI14_003)	Rel-12	LI12	USDoC
S3	= S3-140995	R1-142580	C1, R2	R1, S2, S1	LS on discovery message format for ProSe/D2D		Rel-12	ProSe/D2D	Qualcomm
S3	= S3-140996	R1-142581	S2, C6	C1, R2, R1	Reply LS on Provisioning of ProSe configuration information in a public safety ProSe enabled UE	S2-140847	Rel-12	ProSe/D2D	Qualcomm
S4	= S4-140750	R1-142582	C1, C3, C4, S2, R1, R2	R4	LS on introducing the EVS codec in MTSI		Rel-12	EVS_codec	Panasonic
S5	= S5-143384	R1-142627	S3-LI	SA, RAN, S1, S2, S3, R1, R2, R3, C1, C6	Reply LS on ProSe Lawful Interception	SA3LI14_077r2	Rel-12	Charging Aspects of Proximity-based Services	Qualcomm
R4	= R4-143847	R1-142684	R1		LS on NAICS Parameters		Rel-12	LTE_NAICS	Qualcomm
R3	= R3-141444	R1-142693	S2	R2, R1	LS on Introducing the ProSe Authorized IE		Rel-12	LTE_D2D_Prox	Ericsson
R4	= R4-143843	R1-142697	R2	R3, R1	LS on response SFN handling issue in dual connectivity	R2-141849	Rel-12	LTE_SC_enh_dualC	Huawei
R3	= R3-141479	R1-142736	R2	R1, R4	Reply LS on SFN handling in the dual connectivity	R2-141849 (R1-141908)	Rel-12	LTE_SC_enh_dualC	NSN

Annex D: List of Approved updated WIDs

None

Annex E: List of draft TSs/TRs agreed at RAN1 #77

Tdoc Number	Title	Source	Conclusion/Decision

Annex F: List of actions

- **Outgoing LS.**

[77-43] Fan (Huawei)

R1-142616	LS on HS-DPCCH overhead reduction	RAN1, Huawei	

Email review/approval until 29th May
Done: The LS is agreed acoording to Mr Chair's decision dated on May 30th.

- **CR approval**

[77-30] Arjun (Qualcomm)

R1-142603	25.214 CR0716R1 (Rel-11, F) Clarifications to Multiflow Operation	Qualcomm Incorporated	(R1-142458)

Email review/approval until 28th May
Done: Revision 2 of CR0716 is agreed in R1-142713, according to Mr Chair's email decision made on May 30th.

[77-31] Karri (NSN)

R1-142604	25.214 CR0717R1 (Rel-11, F) Compressed mode in Multiflow assisting (secondary) serving cell	NSN	(R1-142513)

Email review/approval until 29th May
Done: The CR is agreed acoording to Mr Chair's decision dated on May 30th.

[77-32] Fan (Huawei)

R1-142546	25.214 CR0718 (Rel-11, F) Correction of DRX operation for Multiflow	Huawei, HiSilicon	

Email review/approval until 29th May
Done: Done: The following CRs ares agreed acoording to Mr Chair's decision dated on May 30th.

R1-142711	25.214 CR0718R1 (Rel-11, F) Correction of DRX operation for Multiflow	Huawei, HiSilicon	(R1-142546)
R1-142712	25.211 CR0317 (Rel-11, F) Correction of DRX operation for Multiflow	Huawei, HiSilicon	

[77-34] Peyman (Qualcomm)

R1-142464	25.211 CR0316 (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	

[77-35] Peyman (Qualcomm)

R1-142600	25.212 CR0329R1 (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	(R1-142465)

[77-36] Peyman (Qualcomm)

R1-142466	25.214 CR0715 (Rel-12, B) Introduction of DCH Enhancements	Qualcomm Incorporated	

[77-37] Peyman (Qualcomm)

R1-142467	25.300 CR Introduction of DCH Enhancements	Qualcomm Incorporated	

Email discussion/approval until 14th August

Done: No formal email discussions. Status of CRs related to the introduction of DCH enhancements to be checked at RAN1#78.

[77-39] Carmela (Huawei)

R1-142619	25.211 Draft CR (Rel-12, B) Introduction of UMTS Heterogeneous Networks Enhancements	Huawei, HiSilicon	(R1-142554)

Email discussion/approval until 23rd June

Done: Several companies expressed concerns in agreeing this CR in principle. Continue the discussion during RAN1#78.

[77-40] Carmela (Huawei)

R1-142620	25.212 Draft CR (Rel-12, B) Introduction of UMTS Heterogeneous Networks enhancements in 25.212	Huawei, HiSilicon	

Email discussion/approval until 23rd June

Done: According to Mr Chair's decision from June 24th , revised CR is agreed in principle (to be formally agreed @RAN1#78).

[77-41] Carmela (Huawei)

R1-142621	25.213 Draft CR (Rel-12, B) Introduction of UMTS Heterogeneous Networks Enhancements	Huawei, HiSilicon	(R1-142556)

Email discussion/approval until 23rd June

Done: Several companies expressed concerns in agreeing this CR in principle. Continue the discussion during RAN1#78.

[77-42] Carmela (Huawei)

R1-142622	25.214 Draft CR (Rel-12, B) Introduction of UMTS Heterogeneous Networks Enhancements	Huawei, HiSilicon	(R1-142557)

Email discussion/approval until 23rd June

Done: Several companies expressed concerns in agreeing this CR in principle. Continue the discussion during RAN1#78.

[77-44] Peter (Ericsson)

R1-142418 25.214 CR Introduction of Further EUL Enhancements

Email review/approval until June 21th, concerns/improvement suggestions should be provided by June 16th. Discussion to be limited to the features currently in CR0713
Done: No consensus could be achieved. Continue the discussion during RAN1#78.

[77-46] Peter (Ericsson)

R1-142419	25.211 CR0315 (Rel-12, B) Introduction of Enhanced Broadcast of System Information	Ericsson	
R1-142420	25.212 CR0328 (Rel-12, B) Introduction of Enhanced Broadcast of System Information	Ericsson	
R1-142421	25.213 CR0117 (Rel-12, B) Introduction of Enhanced Broadcast of System Information	Ericsson	
R1-142422	25.214 CR0714 (Rel-12, B) Introduction of Enhanced Broadcast of System Information	Ericsson	

Email review/approval until 21th June
Done: According to Mr Chair's decision from June 23rd , revised CRs are agreed in principle (to be formally agreed @RAN1#78).
The revisions capture the comments from RAN1#77, as well as changing the assumed transport channel for the secondary broadcast from S-BCH to BCH, in line with RAN2's revised working assumption. Note that 25.214 CR was considered unnecessary.

[77-01] Wanshi (Qualcomm)

R1-142726	36.213 CR0462 (Rel-12, F) Clarification on SRS antenna switching	Qualcomm	

Email approval until 29th May
Done: Revision 1 of CR0462 is agreed in R1-142770, according to Mr Chair's email decision made on May 30th.

[77-04] Stefan (Ericsson), Brian (Huwei), Bob (Motorola mobility)
Rel-12 CRs
Email approval until 26th May for all Rel-12 CRs (211, 212, 213) reflecting RAN1 #77 meeting agreements
Editors will provide updated Rel-12 CRs by reflecting low cost MTC and 256QAM in small cell enhancement by 8th August, then all delegates should check and comment to editors until RAN1 #78 meeting
Done: The following CRs are agreed for presentation to RAN#64 plenary approval.

R1-142771	36.211 CR0191 (Rel-12, B) Inclusion of eIMTA, TDD-FDD CA, and coverage enhancements	Ericsson	(R1-142538)
R1-142772	36.212 CR0158 (Rel-12, B) Introduction of Rel 12 features of TDD-FDD CA and eIMTA	Huawei	(R1-142763)
R1-142773	36.213 CR0463 (Rel-12, B) Introduction of Rel-12 LTE-Advanced features in 36.213	Motorola Mobility	(R1-142501)

Note: Inclusion of low-cost MTC and 256QAM will be reviewed at RAN1#78.

- **Miscellaneous**

[77-02] Seunghoon (Samsung)
CQI/PMI reporting period for TDD-FDD CA, for email approval until 29th May just focusing on TDD-FDD CA
Done: The following is agreed, according to Mr Chair's decision on May 30th :

- **For TDD-FDD CA with PUCCH on Pcell only, *cqi-pmi-ConfigIndex* for a serving cell is based on table 7.2.2-1A for FDD PCell case and table 7.2.2-1C for TDD PCell case regardless of the frame structure type of the serving cell.**

[77-03] Seunghoon (Samsung)
SRS transmission for TDD-FDD CA for email approval until 29th May
Done: The following is agreed, according to Mr Chair's decision on May 30th :

- **For PUSCH in a FDD cell + type-0 two symbol SRS in a TDD cell, if a UE is not configured with mTAG**
  - **Current specification implies "per-symbol" dropping and then 1st SRS is dropped and 2nd SRS is transmitted.**
  - **To make "per-symbol" dropping more clear in current spec., "in a symbol" is added like "A UE not configured with multiple TAGs shall not transmit SRS in a symbol whenever SRS and PUSCH transmissions happen to overlap in the same symbol"**
- **For PUCCH in a FDD cell + type-0 two symbol SRS in a TDD cell, if a UE is not configured with mTAG and ackNackSRS-SimultaneousTransmission is TRUE,**
  - **1st SRS is dropped and 2nd SRS is transmitted.**

[77-05] Kazuaki (NTT DOCOMO)

R1-142759	Update on RAN1 Excel sheet on LTE Rel-12 UE Capablities	NTT DOCOMO	

Email approval about R1-142759 until 5th June
Done: Updated excel sheet on Rel-12 UE capabilities is agreed in R1-142774, according to decision taken on June 6th. In addition, the following LS is prepared and agreed to let RAN2, Cc RAN3/4 aware of RAN1 conclusions.

R1-142777	LS on updated LTE Rel-12 UE feature list	RAN1, NTT DOCOMO	

[77-06] Zukang (CATT)
eIMTA UE capability
Email discussion until 5th June
Done: Updated eIMTA parameters are agreed and are included in R1-142774, according to decision taken on June 11th. Huawei raised a concern regarding the sentence "It is also uncertain whether additional specification is needed to support such network configuration" – left for further discussion at next meeting.

[77-07] Mattias (Ericsson)

R1-142647	Way Forward on 256QAM for PMCH	Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Verizon, AT&T	

Email approval until 5th June

Done: According to Mr Chair's decision from June 6th, no consensus has been obtained meaning that 256QAM is not supported for PMCH in Rel-12.

[77-08] Sorour (Ericsson)
Small cell on/off transition time reduction for email discussion until 17th June
Done: According to Mr Chair's decision from June 19th, a summury document showing the proposals for transition time reduction is provided in:

R1-142779	Summary of proposed schemes for small cells on/off transition time reduction	Ericsson	

And the following is agreed on UE expectations on what signals are transmitted when an SCell is deactivated and DRS are configured:

- **If a UE is configured with DRS based measurement for a serving SCell that is deactivated, the UE shall not assume transmission of PSS/SSS/PBCH/CRS/CSI-RS from that SCell, except for DRS transmissions until the subframe wherein the activation command is received at the UE.**
  - **FFS MBMS on this SCell.**
  - **FFS further reduction of CRS in an activated SCell.**

Observations on further reduction of transition time for small cell on/off:

- **The number of subframes of CRS needed before decoding the first (E)PDCCH/PDSCH needs further study.**
- **For fine time and frequency tracking, a periodicity of CRS in one subframe in a 5 ms interval was considered sufficient. Further reductions in periodicity may be possible for small cells. Specific values are FFS.**

[77-09] Yunjung (LGE)
Details on DRS for email approval until 2nd June
Done: According to Mr Chair's decision from June 5th, the following is agreed:

- **For subframes (DL subframes and DwPTS region of subframe) within a DRS occasion indicated for possible DRS-based measurements, a UE can assume that at least CRS antenna port 0 for a cell is transmitted**
  - **When UE is indicated with MBSFN subframe configuration or MBSFN related configuration, UE assumption of CRS transmission on MBSFN subframe is per Rel-8**
    - **FFS whether there is a need to enhance signaling**
  - **A UE may assume that all DL subframes and DwPTS region of subframe in a DRS occasion are available at least for CRS as DRS based measurements**
    - **FFS whether number of subframes in a DRS occasion is to be fixed or configurable**
    - **FFS relation to restricted measurement subframe**
  - **FFS whether to indicate the number of CRS ports**
- **If, in addition, CSI-RS is configured as DRS**
  - **For CSI-RS as DRS, at least single antenna port 15 with 2 REs per PRB of CSI-RS RE configuration is supported for CSI-RS based RSRP**
    - **FFS whether to indicate the number of CSI-RS ports**
    - **FFS on supporting other antenna port(s) and/or more REs/PRB**
  - **In a DRS occasion, the relative subframe offset between SSS and one CSI-RS RE configuration (or equivalence) can be different for different CSI-RS RE configurations**
  - **For each CSI-RS RE configuration in a DRS occasion, a UE can assume that the corresponding CSI-RS is transmitted in one subframe**
    - **FFS on whether to allow more than one subframe**

- **– Continue discussion on UE data rate matching on CSI-RS as DRS in RAN1#78**
- **Requirements on measurement bandwidth, periodicity, and duration of a DRS occasion should be discussed in RAN4**

In addition, the following LS is prepared and agreed to inform RAN2/RAN4 of these agreements:

R1-142775	LS on RAN1 agreements on DRS design	RAN1, LGE	

[77-10] David (Huawei)
DRS RSSI and RSRQ for email approval until 17th June
Done: According to Mr Chair's decision from June 20th, the following is agreed:
A single RSSI definition is introduced in Rel-12 for DRS-based RSRQ

- **Discovery RSSI (DRSSI) measurement is used by the UE to derive at least CRS-based RSRQ**
  - **FFS in which subframes and OFDM symbols DRSSI is measured**
  - **FFS how to define RSRQ based on DRSSI**
- **FFS support of inter-frequency measurements for CSI-RS in the DRS**
  - **FFS support of CSI-RSRQ**

In addition the following alternatives for the DRSSI definition are for further discussion until RAN1#78:
Alt1: Discovery RSSI (DRSSI) is measured on configured subframe(s) on OFDM symbols that cannot contain signals potentially present in a DRS occasion, independently of whether the UE is configured to report CSI-RS-based RRM measurements

- **FFS which OFDM symbols depending on CP length and frame structure type**
- **Alt1 may require a new equation of RSRQ with a scaling factor in the denominator**
  - **FFS is this scaling factor would be fixed or could be adjusted by the network**

Alt 2: Discovery RSSI (DRSSI) is measured outside DRS occasions on OFDM symbols that contain CRS port 0.
Alt 3: Measure and average RSSI over all OFDM symbols in a subframe.

- **FFS in which subframes RSSI would be measured (note: for eICIC the subframes are signaled)**

Alt 4: Measure and average RSSI over OFDM symbols containing CRS port 0.

- **Assuming no change to the Rel-8 definition, Alt 4 means RSSI is measured in the same OFDM symbols used for RSRP measurements based on DRS**

[77-11] Yunjung (LGE)
Power control for DC (1) for email discussion until 12th June
Done: According to Mr Chair's decision from June 14th, a summury document showing the outcomes of the discussion is agreed as follows:

R1-142776	Summary of email discussion [77-11]: Details of prority rule based on UCI type across CGs for dual connectivity power control	LG Electronics	

[77-12] Suzuki (Panasonic)
Power control for DC (2) for email discussion until 12th June
Done: According to Mr Chair's decision from June 28th, a summury document showing the outcomes of the discussion is agreed as follows:

R1-142783	Summary of Email Discussion [77-12]: "look-ahead" aspect for Dual Connectivity power control	Panasonic	

[77-13] Fred (NTT DOCOMO)
Power control for DC (3) for email discussion until 12th June
Done: According to Mr Chair's decision from June 18th, a summury document showing the outcomes of the discussion is agreed as follows:

R1-142778	Summary of email discussion [77-13]: Details of PxeNB for power-control of dual connectivity	NTT DOCOMO	

[77-14] Sigen (AL)
Power control for DC (4) for email discussion until 12th June
Done: According to Mr Chair's decision from June 30th, the following is agreed:

- **MeNB sends (P_MeNB, P_SeNB) to UE in a dedicated RRC message.**
- **If P_SeNB is to be configured to a UE, MeNB determines the minimum guaranteed power for the SeNB (P_SeNB), and also sends it to the SeNB via backhaul signaling.**
- **If P_MeNB is to be configured to a UE, MeNB determines the minimum guaranteed power for the MeNB (P_MeNB).**

[77-15] Fred (NTT DOCOMO)
PHR for DC for email discussion/approval until 17th June
Done: According to Mr Chair's decision from June 25th, a summury document showing the outcomes of the discussion is agreed as follows:

R1-142780	Summary of email discussion [77-15]: PHR for dual connectivity	NTT DOCOMO	

[77-16] David (Huawei)
PUCCH on Scell for DC for email discussion/approval until 12th June
Done: According to Mr Chair's decision from June 25th, the following proposal is considered as working assumption:

- **If PUCCH on SCell for CA is supported, the pSCell PUCCH power control of dual connectivity is reused for the SCell PUCCH in CA, with the following clarifications:**
  - **FFS which (if any) feature introduced for dual connectivity may not need to be supported for the transmission of PUCCH on SCell for CA**
    - **E.g. CSS on the SCell that carries PUCCH, transmission of DCI format 3/3A with PUCCH-TPC-RNTI on the SCell that carries PUCCH, reserved power, PHR report**

FFS for how to transmit UCI on PUSCH if PUCCH on SCell for CA is supported.

[77-17] Yufei (Ericsson)
How to handle UE capabilities for dual-connectivity is for email discussion/approval until 12th June
Done: According to Mr Chair's decision from June 28th, a summury document showing the outcomes of the discussion is agreed as follows:

R1-142781	Summary of Email Discussion [77-17]: UE Capabilities for Dual Connectivity	Ericsson	

Furthermore, the following LS to RAN2 is agreed

R1-142784	LS on Maximum Number of Transport Block Bits in Dual-Connectivity	RAN1, Ericsson	

[77-18] Hanbyul (LGE)
TA in SA for D2D for email discussion/approval until 14th August. Also discuss/approve detailed solution in this thread.
Done: Status to be checked at RAN1#78.

[77-19] Hossein (Huawei)
Type 2B discovery for D2D for email discussion until 17th June. Patterns for consideration to be provided by email by 5th June, then discuss following possible agreements until 17th June, then evaluations/analysis/thoughts to be provided at RAN1#78.
Done: According to Mr Chair's decision from June 25th, it is agreed that:
The following criterion shall be considered for the purpose of selecting a hopping pattern for type 2B discovery :
- **For half duplex, the pattern ensures two discovery resources used by different UEs are at least once not transmitted on the same sub-frame.**

The following performance metrics shall be used:
- **Number of UEs discovered as a function of time (system-level metric)**

Other metrics can be considered additionally, for example,
- **The statistics of the fraction of times any two discovery messages transmitted by different UEs within the same reception pool occur on the same sub-frame**
- **WAN performance loss caused by the cellular spectrum fragmentation in a discovery subframe.**

[77-20] Shailesh (Qualcomm)
RRC parameter list and LS for D2D for email approval until 31st July
Done: According to Mr Chair's decision from August 9th, the following is agreed and sent to RAN2.

R1-142786	Spreadsheet on RRC parameters for ProSe LTE D2D	Qualcomm	
R1-142787	LS on RRC parameters for ProSe LTE D2D	RAN1, Qualcomm	

[77-21] Jeff (Mediatek)
Higher-layer signaling for NAICS for email discussion/approval until 24th June
Done: Status to be checked at RAN1#78.

[77-22] Bishwarup (NSN)
Phase-2 calibration and baseline simulation for 3D channel model
Email discussion until 14th August
Done: Status to be checked at RAN1#78.

[77-23] Elean (Huawei)

RRC parameter list and LS for SCE for email approval until 31st July
Done: According to Mr Chair's decision from August 9th, the following is agreed and sent to RAN2.

R1-142788	LS on L1 parameters for SCE-PHY on efficient operation	RAN1, Huawei	

[77-33] Peyman (Qualcomm)
Remaining issues for DCH enh. for email discussion/approval until 23rd June
Done: According to Mr Chair's decision from July 8th, the following is agreed:

Compress mode without SF reduction:
- **In compressed mode with basic configuration of DCH enhancements, the frame structure of DPCH in TTIs with a CM transmission gap (TG) is as follows:**
  - **DL DPCH is sent for the entire 20ms duration in a 20ms compression interval (i.e., second radio frame is not DTXed), except for the DL DPCH slots in CM transmission gap that are DTXed.**
  - **UL DPCH uses the same frame structure as agreed for the full configuration.**
  - **When UL is in 10ms transmission mode, DL ILPC is frozen during DL DPCH slots for which TPC bits are not available due to absence of UL DPCCH.**
  - **The SIR target corresponding to 10ms transmission mode is used for DL DPCH power control.**
  - **CM measurement operation with SF = 256 and more than 7 slots of transmission gap in one 20ms TTI is FFS.**

SRB improvement:
- **NodeB operation in 10ms transmission mode:**
  - **NodeB continues to transmit DL DPCH in the second 10ms radio frame in a 20ms compression interval (CI) if DL DCCH is present.**
  - **Since UL DPCCH is gated in the second radio frame of the 20ms CI, DL DPCH is transmitted without ILPC when transmitted in the second 10ms radio frame of a 20ms CI, i.e, the power level of DPCH is kept at the power level of the DPCH in the last slot where TPC bit is received on UL DPCCH.**
- **UE operation in 10ms transmission mode:**
  - **UE DRXes DL DPCH in the second radio frame of a 20ms CI if, and only if, UE BTFD procedure indicates DCCH absence, i.e., BTFD with a TFCI hypothesis without DCCH results in CRC pass.**

UL FET:
Do not consider UL FET for DCH enhancements further.

[77-38] Peter Z. (Huawei)
Remaining details of secondary pilot solution for HetNet for email discussion/approval until 29th May
Done: According to Mr Chair's decision from June 18th, the following is agreed:
- **Maximum power scaling for DPCCH2: When DPCCH2 is configured, DPCCH2 is always power scaled with HS-DPCCH so that the ratio HS-DPCCH/DPCCH2 remains constant.**
- **Should the non-serving cell be aware of the presence of DPCCH2? The non-serving cell should be informed when DPCCH2 is present.**
- **For the Channelization code for DPCCH2, adopt code 41 on the Q-branch for DPCCH2.**

In addition, one remaining issue (transmission of DPCCH2) is for further discussion until next meeting by considering the following two options:
- **DPCCH2 is always transmitted when DPCCH is transmitted.**

- **DPCCH2 is only transmitted when HS-DPCCH is transmitted.**

[77-45] Peter (Ericsson)

R1-142521	Specification Impact for Grant Detection TDM operation	NSN	

Email discussion/approval until 14th August on introduction of agreements of RAN1#77 to the physical layer specifications
Done: Status to be checked at RAN1#78.

Annex G: List of participants at RAN1 #77

Please see excel file attached to this report

Annex H: TSG RAN WG1 meetings in 2014 - 2015

TITLE	TYPE	DATES	LOCATION	CTRY
3GPPRAN1#78	WG	18 – 22 Aug 2014	Dresden	Germany
3GPPRAN1#78bis	WG	6 – 10 Oct 2014	Ljubljana	Slovenia
3GPPRAN1#79	WG	17 – 21 Nov 2014	San Francisco	US
3GPPRAN1#80	WG	9 – 13 Feb 2015	Athens	Greece
3GPPRAN1#80bis	WG	20 – 24 Apr 2015	Belgrade	Serbia
3GPPRAN1#81	WG	25 – 29 May 2015	TBD	Japan
3GPPRAN1#82	WG	24 – 28 Aug 2015	TBD	China
3GPPRAN1#82bis	WG	5 – 9 Oct 2015	TBD	EU
3GPPRAN1#83	WG	16 – 20 Nov 2015	TBD	US

MEETING TYPES	
AH = Ad Hoc	CM = Chairmen's meeting
JM = Joint	OR = Ordinary
PM = Preparatory Meeting	RG = Rapporteurs Group
RM = Resolution Meeting	SG = Steering Group
ST = Startup Meeting	TG = Task Group
WG = Working Group	XO = Extraordinary

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