UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 8,340,634 B2
APPLICATION NO. : 12/695980
DATED : December 25, 2012
INVENTOR(S) : Gregory G. Raleigh

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Claims

In column 48, lines 40-41 (the first and second lines of claim 5), the phrase "further comprising service design interface" should be changed to --further comprising a service design interface--.

In column 48, lines 41-42 (the second and third lines of claim 5), the phrase "programming more processors to implement a service policy" should be changed to --programming the one or more processors to implement a service policy--.

In column 49, lines 7-8 (the twelfth and thirteenth lines of claim 12), the phrase "the network accounting billing system" should be changed to --the network accounting system--.

In column 49, line 42 (the sixth line of claim 15), the word "device" should be deleted.

In column 49, line 43 (the seventh line of claim 15), the word "ruleto" should be changed to --rule to--.

In column 49, line 57 (the seventh line of claim 16), the word "ruleto" should be changed to --rule to--.

In column 50, line 44 (the first line of claim 29), the word "They" should be changed to --The--.

Signed and Sealed this
Thirteenth Day of May, 2014

Michelle K. Lee

Michelle K. Lee
Deputy Director of the United States Patent and Trademark Office

SAMSUNG 1037

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Title:
Gregory G. Raleigh	Enhanced Roaming Services and Converged Carrier Networks With Device Assisted Services and a Proxy
Application Serial No. 12/695,980	Patent No. 8,340,634
Filing Date: January 28, 2010	Issue Date: December 25, 2012

Commissioner for Patents
Office of Patent Publication
ATTN: Certificate of Correction Branch
P.O. Box 1450
Alexandria, VA 22313-1450

MISCELLANEOUS COMMUNICATION REGARDING CERTIFICATE OF CORRECTION

Madam:

Applicant/Patentee (hereinafter, "Applicant") respectfully requests that the Office issue a Certificate of Correction for U.S. Patent No. 8,340,634 to correct typographical errors in claims 5, 12, 15, 16, and 29. Four of the errors being corrected are the Office's errors, and one is Applicant's error.

Claim 5 – Office's Error

In Applicant's amendment filed on September 4, 2012, claim 5 recites:

> 5. The system recited in claim 1, further comprising **a** service design interface configured to assist in programming **the one or** more processors to implement a service policy.

But in the issued patent, claim 5 recites:

5. The system recited in claim 1, further comprising service design interface configured to assist in programming more processors to implement a service policy.

Claim 12 – Office's Error

In Applicant's amendment filed on September 4, 2012, claim 12 recites:

12. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and wherein the one or more processors are configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating the service usage information; and

applying a set of rules to the aggregated service usage information;

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating a set of one or more CDRs to the network accounting system.

In the issued patent, however, claim 12 recites:

12. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and wherein the one or more processors are configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating the service usage information; and

applying a set of rules to the aggregated service usage information;

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating a set of one or more CDRs to the network accounting **billing** system.

Claim 15 – Office's Error

In Applicant's amendment filed on September 4, 2012, claim 15 recites:

15. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and wherein the one or more processors are further configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating the service usage information; and

applying a set of at least one rule to the aggregated service usage information, wherein the set of at least one rule includes a bill by account rule;

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating a set of one or more CDRs to a billing interface or a billing system.

But in the issued patent, claim 15 recites:

15. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and wherein the one or more processors are configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating the service usage information **device**; and

applying a set of at least one **ruleto** the aggregated service usage information, wherein the set of at least one rule includes a bill by account rule;

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating a set of one or more CDRs to a billing interface or a billing system.

Claim 16 – Office's Error

In Applicant's amendment filed on September 4, 2012, claim 16 recites:

16. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and wherein the one or more processors are configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating the service usage information; and

applying a set of at least one rule to the aggregated service usage information, wherein the set of at least one rule includes a bill by account rule;

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating a set of one or more CDRs to a billing interface or a billing system, wherein at least one of the one or more CDRs includes a billing offset.

In the issued patent, however, claim 16 recites:

> 16. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and wherein the one or more processors are configured to format the service usage information into a syntax that can be used by a network accounting system by:
>
> aggregating the service usage information; and
>
> applying a set of at least one **ruleto** the aggregated service usage information, wherein the set of at least one rule includes a bill by account rule;
>
> and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating a set of one or more CDRs to a billing interface or a billing system, wherein at least one of the one or more CDRs includes a billing offset.

Claim 29 – Applicant's Error

In both Applicant's amendment filed on September 4, 2012 and in the issued patent, claim 29 recites:

> 29. **They** system recited in claim 1, further comprising the network accounting system, and wherein the network accounting system is configured to assist in allocating at least a portion of the formatted service usage information to an account associated with a sponsor entity, the sponsor entity being an entity other than a user of the device.

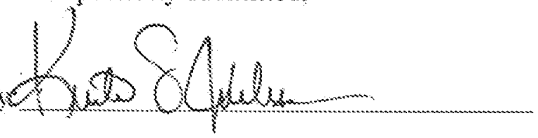
The word "They" should be "The."

CONCLUSION

Applicant respectfully requests issuance of the Certificate of Correction to correct the errors in claims 5, 12, 15, 16, and 29. Because the error in claim 29 was Applicant's error, Applicant is submitting the fee for a Certificate of Correction with this request. The Office is hereby authorized to charge any additional fee required or credit any overpayment to Deposit Account No. 50-5876.

Respectfully submitted,

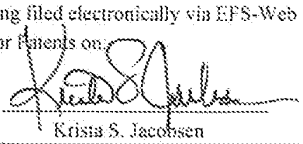
Date: March 11, 2014

By: 

Krista S. Jacobsen
Reg. No. 59,374
(408) 455-5539

CERTIFICATE OF ELECTRONIC TRANSMISSION

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being filed electronically via EFS-Web addressed to the Commissioner for Patents on

Date: March 11, 2014 By: 

Krista S. Jacobsen

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 8,340,634

APPLICATION NO.: 12/695,980

ISSUE DATE : December 25, 2012

INVENTOR(S) : Gregory G. Raleigh

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In column 49, line 57 (the seventh line of claim 16), the word "ruleto" should be changed to --rule to--.

In column 50, line 44 (the first line of claim 29), the word "They" should be changed to --The--.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Headwater Partners I LLC
350 Marine Parkway, Suite 300
Redwood Shores, CA 94065

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal	
Application Number:	12695980
Filing Date:	28-Jan-2010
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	Krista Susan Jacobsen
Attorney Docket Number:	RALEP030 [26WV-160507]

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Certificate of Correction	1811	1	100	100
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**100**

Electronic Acknowledgement Receipt	
EFS ID:	18430357
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	107265
Filer:	Krista Susan Jacobsen
Filer Authorized By:	
Attorney Docket Number:	RALEP030 [26WV-160507]
Receipt Date:	11-MAR-2014
Filing Date:	28-JAN-2010
Time Stamp:	12:35:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$100
RAM confirmation Number	11548
Deposit Account	505876
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	P030CoC_req.pdf	789657 93db3514d6ebe498e5bdc8940ebb892f9cef8c61	no	7
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30491 db1db7d44a5789e1cf92743206664f76cb801faa	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	820148		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,980	12/25/2012	8340634	RALEP030 [26WV-160507]	8973

107265 7590 12/05/2012

Headwater Partners I LLC - Outside Firm 1
350 Marine Parkway, Suite 300
Redwood Shores, CA 94065

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 209 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Gregory G. Raleigh, Woodside, CA;

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PTO/SB/08 (08-03)

Change(s) applied to document, /L.A.S./ 11/20/2012

Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	3	of	4	Atty Docket No.	RALEP030

	EEEE.	US 2008/0305793	12-11-2008	GALLAGHER et al.	
	FFFF.	US 2008/0083013	04-03-2008	SOLIMAN et al.	
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	HHHH.	US 6,574,321	06-03-2003	COX et al.	
	IIII.	US 2006/0291477	12-28-2006	CROAK et al.	
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	KKKK.	US 2003/0229900	12-11-2003	Reisman	
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	SSSS.	US 6,996,076	02-07-2006	FORBES et al.	
	TTTT.	US 2008/0183812	07-31-2008	PAUL et al.	
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	WWWW.	US 2008/0059743	03-06-2008	BYCHKOV et al.	
	XXXX.	US 2008/0132268	06-05-2008	CHOI-GROGAN et al.	
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	AAAAA.	US 2007/0140113	06-21-2007	Gemelos	
	BBBBB.	US 2002/0138601	09-26-2002	PIPONIUS et al.	
	CCCCC.	US 2002/0176377	11-28-2002	Hamilton	
	DDDDD.	US 2006/0034256	02-16-2006	ADDAGATLA et al.	
	EEEEE.	US 2005/0228985	10-13-2005	YLIKOSKI et al.	
	FFFFF.	US 2007/0036312	02-15-2007	CAI et al.	
	GGGGG.	US 2004/0082346	04-29-2004	SKYTT et al.	
	HHHHH.	US 7,142,876	11-28-2006	TROSSEN et al.	
	IIIII.	US 2008/0005561	01-03-2008	BROWN et al.	
	JJJJJ.	US 2007/0101426	05-03-2007	LEE et al.	
	KKKKK.	US 2008/0222692	09-11-2008	ANDERSSON et al.	
7-3-2008	LLLLL.	US 2008/0160958	~~04-03-2008~~	ABICHANDANI et al.	
	MMMMM	US 2006/0048223	03-02-2006	LEE et al.	
	NNNNN.	US 2007/0104126	5-10-2007	CALHOUN et al.	
	OOOOO.	US 2007/0243862	10-18-2007	COSKUN et al.	
	PPPPP.	US 2008/0109679	05-08-2008	WRIGHT et al.	
	QQQQQ.	US 2006/0242685	10-26-2006	HEARD et al.	
	RRRRR.	US 2008/0130656	06-05-2008	KIM et al.	
	SSSSS.	US 2005/0021995	01-27-2005	LAL et al.	
7-3-2008	TTTTT.	US 2008/0162704	~~04-03-2008~~	POPLETT et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

PTO/SB/08 (08-03)

Substitute for form 1449/PTO

Information Disclosure Statement By Applicant
(Use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application No.:	12/695,980
Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	2617
Examiner Name	Not Assigned
Atty Docket No.	RALEP030

Change(s) applied to document, /L.A.S./ 11/20/2012

	OO.	US 2007/0140275	06-21-2007	BOWMAN et al.	
	PP.	US 2003/0182435	09-25-2003	REDLICH et al.	
	QQ.	US 6,263,055	07-17-2001	GARLAND et al.	
	RR.	US 5,940,472	08-17-1999	NEWMAN et al.	
	SS.	US 2008/0318550	12-25-2008	Deatley	
	TT.	US 2008/0298230	12-01-2008	LUFT et al.	
	UU.	US 2007/0220251	09-20-2007	ROSENBERG et al.	
	VV.	US 2007/0100981	05-03-2007	ADAMCZYK et al.	
	WW.	US 2007/0022289	01-25-2007	ALT et al.	
	XX.	US 2008/0095339	04-24-2008	ELLIOTT et al.	
	YY.	US 2006/0233166	10-19-2006	BOU-DIAB et al.	
	ZZ.	US 2008/0168523	07-10-2008	ANSARI et al.	
	AAA.	US 2006/0183462	08-17-2006	~~KOLEHAINEN et al.~~	Kolehmainen
	BBB.	US 2006/0165060	07-27-2006	Dua	
	CCC.	US 2008/0177998	07-24-2008	APSANGI et al.	
	DDD.	US 2008/0064367	03-13-2008	NATH et al.	
	EEE.	US 2004/0168052	08-26-2004	CLISHAM et al.	
	FFF.	US 2005/0198377	09-08-2005	FERGUSON et al.	
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	HHH.	US 2006/0218395	09-28-2006	Maes	
	III.	US 2005/0055309	03-10-2005	WILLIAMS et al.	
	JJJ.	US 2003/0050837	03-13-2003	Kim	
	KKK.	US 2005/0266825	12-01-2005	Clayton	
2006/0178918	LLL.	US ~~2006/0178917~~	08-10-2006	Mikurak	
	MMM.	US 2007/0055694	03-08-2007	RUGE et al.	
	NNN.	US 2005/0097516	05-05-2005	DONNELLY et al.	
	OOO.	US 7,356,337	04-08-2008	Florence	
	PPP.	US 2007/0019670	01-25-2007	Falardeau	
	QQQ.	US 2004/0127200	07-01-2004	SHAW et al.	
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	SSS.	US 7,349,695	03-25-2008	OOMMEN et al.	
	TTT.	US 2004/0098715	05-20-2004	AGHERA et al.	
	UUU.	US 2006/0072646	04-06-2006	FEHER et al.	
	VVV.	US 2006/0206904	09-14-2006	WATKINS et al.	
	WWW.	US 2005/0060266	03-17-2005	DEMELLO et al.	
	XXX.	US 6,047,268	04-04-2000	BARTOLI et al.	
	YYY.	US 6,639,975	10-28-2003	O'NEAL et al.	
	ZZZ.	US 6,539,082	03-25-2003	LOWE et al.	
	AAAA.	US 2008/0134330	06-05-2008	KAPOOR et al.	
	BBBB.	US 2004/0047358	03-11-2004	CHEN et al.	
	CCCC.	US 2007/0274327	11-29-2007	KAARELA et al.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

PTO/SB/08 (08-03)

Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	4	Atty Docket No.	RALEP030

U.S. Patent Documents					
Examiner Initials	CiteNo.	Document Number Number-Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A.	US 2006/0048223	03-02-2006	LEE et al.	
	B.	US 6,965,667	11-15-2005	TRABANDT et al.	
	C.	US 2008/0268813	10-13-2008	Stephane H. Maes	
	D.	US 2007/0255848	11-01-2007	SEWALL et al.	
	E.	US 2008/0039102	02-14-2008	SEWALL et al.	
	F.	US 2006/0233108	10-19-2006	Murali R. Krishnan	
	G.	US 5,892,900	04-06-1999	GINTER et al.	
	H.	US 7,403,763	07-22-2008	Stephane H. Maes	
	I.	US 7,317,699	01-08-2008	GODFREY et al.	
	J.	US 7,353,533	04-1-2008	WRIGHT et al.	
	K.	US 7,322,044	01-22-2008	Scott E. Hrastar	
	L.	US 7,058,968	06-06-2006	ROWLAND et al.	
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Change(s) applied	Q.	US 7,317,699	01-08-2008	GODFREY et al.	
	R.	US 7,325,037	01-29-2008	Karen L. Lawson	
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/L.A.S./	T.	US 2004/0044623	03-04-2004	WAKE et al.	
11/20/2012	U.	US 2006/0040642	02-23-2006	BORIS et al.	
	V.	US 2008/0229388	09-18-2008	Stephane H. Maes	
	W.	US 2008/0120688	05-22-2008	QIU et al.	
	X.	US 2003/0236745	12-25-2003	HARTSELL et al.	
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	CC.	US 2004/0073672	04-15-2004	Fascenda	
	DD.	US 2006/0143098	06-29-2006	Lazaridis	
	EE.	US 6,098,878	08-08-2000	DENT et al.	
	FF.	US 2004/0198331	10-07-2004	COWARD et al.	
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	HH.	US 2005/0107091	05-19-2005	VANNITHAMBY et al.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,980	01/28/2010	Gregory G. Raleigh	RALEP030 [26WV-160507]	8973

107265 7590 11/14/2012

Headwater Partners I LLC - Outside Firm 1
350 Marine Parkway, Suite 300
Redwood Shores, CA 94065

EXAMINER	
RUDY, ANDREW J	

ART UNIT	PAPER NUMBER
3687	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

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patent@headwaterllc.com

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
12/695,980	28 January, 2010	RALEIGH, GREGORY G.	RALEP030 [26WV-160507]

Headwater Partners I LLC - Outside Firm 1
350 Marine Parkway, Suite 300
Redwood Shores, CA 94065

EXAMINER	
ANDREW JOSEPH RUDY	
ART UNIT	PAPER
3687	20121107

DATE MAILED:

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Commissioner for Patents

Applicant's Information Disclosure Statement (IDS) submitted October 9, 2012 has been reviewed. Note the attached IDS.

/ANDREW JOSEPH RUDY/
Primary Examiner
Art Unit: 3687

PTO-90C (Rev.04-03)

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	12695980
Filing Date	2010-01-28
First Named Inventor	Raleigh, Gregory G.
Art Unit	3687
Examiner Name	Rudy, Andrew J.
Attorney Docket Number	RALEP030

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

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	22	7877090		2011-01-25	Maes, Stephane H.	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

	31	8155620		2012-04-10	Wang, Jun et al.	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

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	52	8275830		2012-09-25	Raleigh, Gregory G.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

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	54	8064896		2011-11-22	Bell, Kris M. et al.	
	55	8135392		2012-03-13	Marcellino, Chris et al.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20100144310		2010-06-10	Bedingfield Sr., James Carlton, et al.	
	2	20080132201		2008-06-05	Karlberg, Johan	
	3	20080081606		2008-04-03	Cole, Terry L.	
	4	20090248883		2009-10-01	Suryanarayana, Lalitha et al.	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
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EXAMINER SIGNATURE

Examiner Signature	/Andrew Joseph Rudy/	Date Considered	11/07/2012

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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PART B - FEE(S) TRANSMITTAL

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Ann Taylor (Depositor's name)
(Signature)
October 19, 2012 (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,980	01/28/2010	Gregory G. Raleigh	RALEP030 [26WV-160507]	8973

TITLE OF INVENTION: ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1770	$300	$0	$2070	01/18/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
RUDY, ANDREW J	3687	455-407000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
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1 Krista S. Jacobsen
2 Sheppard, Mullin, Richter & Hampton LLP
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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(A) NAME OF ASSIGNEE: Headwater Partners I, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Redwood Shores, CA

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
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5. **Change in Entity Status** (from status indicated above)
☒ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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Typed or printed name Krista S. Jacobsen Registration No. 59374

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner:
Gregory G. Raleigh	Andrew J. Rudy
Serial No. 12/695,980	Art Unit: 3687
Filed: January 28, 2010	Conf. No.: 8973

Title: Enhanced Roaming Services And Converged Carrier Networks With Device Assisted Services And A Proxy

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

NOTICE OF CHANGE OF ENTITY STATUS FROM LARGE TO SMALL

Dear Sir:

The Applicant is entitled to claim small entity status for the above-referenced patent application, and shall henceforth pay fees due at the small entity rate.

Please change your records to reflect this change in entity status.

No fee should be required for this change of entity status, but if such fee is determined to be owned, please charge Deposit Account No. **50-5876** for the same.

Respectfully submitted,

Date: October 19, 2012

By: _____

Krista S. Jacobsen, Reg. No. 59,374
Headwater Partners I, LLC
350 Marine Parkway, Suite 300
Redwood Shores, CA 94065
Telephone: (650) 517-2798

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Date: October 19, 2012 By: _____
Ann Taylor

Electronic Patent Application Fee Transmittal

Application Number:	12695980
Filing Date:	28-Jan-2010
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	Krista Susan Jacobsen/Ann Taylor
Attorney Docket Number:	RALEP030 [26WV-160507]

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Publ. Fee- early, voluntary, or normal	1504	1	300	300
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	885	885

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1185**

Electronic Acknowledgement Receipt	
EFS ID:	14035491
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	107265
Filer:	Krista Susan Jacobsen/Ann Taylor
Filer Authorized By:	Krista Susan Jacobsen
Attorney Docket Number:	RALEP030 [26WV-160507]
Receipt Date:	19-OCT-2012
Filing Date:	28-JAN-2010
Time Stamp:	20:07:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

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Payment Type	Deposit Account
Payment was successfully received in RAM	$1185
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Warnings:					
Information:					
2	Miscellaneous Incoming Letter	P030Ltr.pdf	212482 aeb967187f62f1c9aea6d9d742d0086d3d07ac9e	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32458 e4f98eff9cab65d508f02817389251469970267d	no	2
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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

107265 7590 10/18/2012
Headwater Partners I LLC - Outside Firm 1
350 Marine Parkway, Suite 300
Redwood Shores, CA 94065

EXAMINER	
RUDY, ANDREW J	
ART UNIT	PAPER NUMBER
3687	

DATE MAILED: 10/18/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,980	01/28/2010	Gregory G. Raleigh	RALEP030 J26WV-160507]	8973

TITLE OF INVENTION: ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1770	$300	$0	$2070	01/18/2013

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

107265 7590 10/18/2012
Headwater Partners I LLC - Outside Firm 1
350 Marine Parkway, Suite 300
Redwood Shores, CA 94065

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,980	01/28/2010	Gregory G. Raleigh	RALEP030 J26WV-160507]	8973

TITLE OF INVENTION: ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1770	$300	$0	$2070	01/18/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
RUDY, ANDREW J	3687	455-407000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
- ❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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107265 7590 10/18/2012

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EXAMINER	
RUDY, ANDREW J	

ART UNIT	PAPER NUMBER
3687	

DATE MAILED: 10/18/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 209 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 209 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No.	Applicant(s)	
	12/695,980	RALEIGH, GREGORY G.	
	Examiner	Art Unit	
	ANDREW JOSEPH RUDY	3687	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the 04 September 2012 Amendment*.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-57*.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Allowable Subject Matter

1. Pursuant to Applicant's September 4, 2012 Amendment and REMARKS, claims 1-57 are allowed.

2. Further pertinent references of interest are noted on the attached PTO-892.

3. Applicant's Information Disclosure Statement (IDS) has been reviewed. Note the attached IDS.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREW JOSEPH RUDY whose telephone number is (571)272-6789. The examiner can normally be reached on Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Gart can be reached on 571-272-3955. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ANDREW JOSEPH RUDY/
Primary Examiner, Art Unit 3687

Notice of References Cited	Application/Control No. 12/695,980	Applicant(s)/Patent Under Reexamination RALEIGH, GREGORY G.	
	Examiner ANDREW JOSEPH RUDY	Art Unit 3687	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-8,275,830	09-2012	Raleigh, Gregory G.	709/203
*	B	US-8,244,241	08-2012	Montemurro, Michael	455/434
*	C	US-8,238,287	08-2012	Gopi et al.	370/328
*	D	US-8,155,620	04-2012	Wang et al.	455/405
*	E	US-8,126,123	02-2012	Cai et al.	379/114.03
*	F	US-7,957,511	06-2011	Drudis et al.	379/201.01
*	G	US-7,930,553	04-2011	Satarasinghe et al.	713/184
*	H	US-7,756,534	07-2010	Anupam et al.	455/466
*	I	US-7,636,574	12-2009	Poosala, Viswanath	455/456.3
*	J	US-7,418,257	08-2008	Kim, Myong-Ju	455/411
*	K	US-7,174,174	02-2007	Boris et al.	455/461
*	L	US-7,113,997	09-2006	Jayapalan et al.	709/229
*	M	US-6,678,516	01-2004	Nordman et al.	455/414.1

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 12/695,980	Applicant(s)/Patent Under Reexamination RALEIGH, GREGORY G.	
	Examiner ANDREW JOSEPH RUDY	Art Unit 3687	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,594,777	01-1997	Makkonen et al.	455/406
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

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	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	12695980
Filing Date	2010-01-28
First Named Inventor	Raleigh, Gregory G.
Art Unit	3687
Examiner Name	Rudy, Andrew J
Attorney Docket Number	RALEP030

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5794142		1998-08-11	Vanttila, Jaakko et al.	
	2	5903845		1999-05-11	Buhrmann, Michael et al.	
	3	5933778		1999-08-03	Buhrmann, Michael et al.	
	4	6078953		2000-06-20	Vaid, Aseem et al.	
	5	6317584		2001-11-13	Abu-Amara, Hosame et al.	
	6	6418147		2002-07-09	Wiedeman, Robert A	
	7	6765864		2004-07-20	Natarajan, Shankar et al.	
	8	6829596		2004-12-07	Frazee, Steve	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

	9	7024200		2006-04-04	McKenna, Daniel B. et al.	
	10	7366497		2008-04-29	Nagata, Hideaki	
	11	7388950		2008-06-17	Elsey, Nicholas J. et al.	
	12	7450927		2008-11-11	Creswell, Carroll W. et al.	
	13	7499537		2009-03-03	Elsey, Nicholas J. et al.	
	14	7610328		2009-10-27	Haase, Oliver et al.	
	15	7620162		2009-11-17	Aaron, Jeffrey A. et al.	
	16	7650137		2010-01-19	Jobs, Steven P. et al.	
	17	7693720		2010-04-06	Kennewick, Robert A. et al.	
	18	7734784		2010-06-08	Araujo, Wladimir et al.	
	19	7747699		2010-06-29	Prueitt, James K. et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

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	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

	20	7792708		2010-09-07	Alva, Jessi	
	21	7797401		2010-09-14	Stewart, Hugh Donal et al.	
	22	7822837		2010-10-26	Urban, Mark et al.	
	23	7949529		2011-05-24	Weider, Chris et al.	
	24	8023425		2011-09-20	Raleigh, Gregory G.	
	25	8095666		2012-01-10	Schmidt, Jonathan E. et al.	
	26	8099077		2012-01-17	Chowdhury, Amor et al.	
	27	8099517		2012-01-17	Jia, Lujun R. et al.	
	28	8170553		2012-05-01	Bennett, James D.	
	29	7984130		2011-07-19	Bogineni, Kalyani et al.	
	30	8019687		2011-09-13	Wang, Feng Chi et al.	

EFS Web 2.1.17

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

	31	8144591		2012-03-27	Ghai, Rajat et al.	
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	12695980
Filing Date	2010-01-28
First Named Inventor	Raleigh, Gregory G.
Art Unit	3687
Examiner Name	Rudy, Andrew J
Attorney Docket Number	RALEP030

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	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

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	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

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	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
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	Attorney Docket Number	RALEP030

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

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If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2010088413	WO		2010-08-05	Headwater Partners I LLC		☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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EXAMINER SIGNATURE

Examiner Signature	/Andrew Joseph Rudy/	Date Considered	10/05/2012

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

Search Notes	Application/Control No.	Applicant(s)/Patent under Reexamination	
	12/695,980	RALEIGH, GREGORY G.	
	Examiner	Art Unit	
	ANDREW JOSEPH RUDY	3687	

SEARCHED			
Class	Subclass	Date	Examiner
705	30	10/5/2012	AJR
455	405-408	10/5/2012	AJR
455	411,414.1	10/5/2012	AJR
455	432.1,469	10/5/2012	AJR
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Class	Subclass	Date	Examiner
455	**405-411**	**10/5/2012**	**AJR**
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709	203,224	10/5/2012	AJR

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR

Issue Classification	Application/Control No.	Applicant(s)/Patent under Reexamination	
	12/695,980	RALEIGH, GREGORY G.	
	Examiner	Art Unit	
	ANDREW JOSEPH RUDY	3687	

ISSUE CLASSIFICATION

ORIGINAL			CROSS REFERENCE(S)						
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)						
455	407	455	432.1						
INTERNATIONAL CLASSIFICATION		709	224						
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XXXXXXXXXXXXXXXXXXXXXX (Assistant Examiner) (Date)	/Andrew Joseph Rudy/ 10/5/2012 (Primary Examiner) (Date)	Total Claims Allowed: 57
(Legal Instruments Examiner) (Date)		O.G. Print Claim(s): 1 / O.G. Print Fig.: 18

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

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	First Named Inventor	Raleigh, Gregory G.
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	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

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	Attorney Docket Number	RALEP030

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	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

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	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

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	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
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Examiner Signature		Date Considered	

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	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP030

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

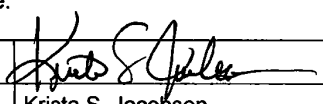
☐ See attached certification statement.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	2012-10-09
Name/Print	Krista S. Jacobsen	Registration Number	59374

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Electronic Patent Application Fee Transmittal	
Application Number:	12695980
Filing Date:	28-Jan-2010
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	Krista Susan Jacobsen/Ann Taylor
Attorney Docket Number:	RALEP030 [26WV-160507]
Filed as Small Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	13945848
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	107265
Filer:	Krista Susan Jacobsen/Ann Taylor
Filer Authorized By:	Krista Susan Jacobsen
Attorney Docket Number:	RALEP030 [26WV-160507]
Receipt Date:	09-OCT-2012
Filing Date:	28-JAN-2010
Time Stamp:	19:39:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	6833
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2	Information Disclosure Statement (IDS) Form (SB08)	P030IDS.pdf	1597872 0dee11887b4e6605aa720fd120ced0d4ca312dd3	no	8
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First Named Inventor	Gregory G. Raleigh
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Examiner Name	Andrew J. Rudy
Attorney Docket Number	RALEP030

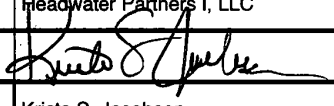
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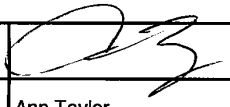
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Raleigh	Examiner:	RUDY, Andrew J.
Serial No.:	12/695,980	Art Unit:	3687
Filed:	January 28, 2010	Conf. No.:	8973
Title:	Enhanced Roaming Services and Converged Carrier Networks With Device Assisted Services and a Proxy		

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AMENDMENT AND RESPONSE

Sir:

In response to the Office Action dated March 1, 2012, the deadline for response ending on September 4, 2012, with the enclosed request for a three-month extension of time, please amend the above-identified application as follows:

Amendments to the Claims begin on page 2.

Remarks begin on page 12.

AMENDMENTS TO THE CLAIMS

Without prejudice and without surrender of any subject matter, please amend the claims as follows:

1. (Currently amended) A system, comprising:

one or more processors, including a processor of a proxy network device in communication with a device through a particular logical channel over a wireless network, the particular logical channel configured to support less than all data traffic associated with the device, the less than all data traffic including traffic associated with a particular service activity of a plurality of service activities available to the device, ~~wherein~~ the one or more processors [[is]] configured to:

obtain ~~collect device generated~~ service usage information for ~~one or more~~ the device[[s]], the service usage information associated with the particular service activity ~~in wireless communication on the wireless network~~; ~~and~~

~~provide~~ format the ~~device generated~~ service usage information into a syntax ~~and a communication protocol~~ that can be used by a ~~other~~ network accounting system ~~devices to augment or replace network generated service usage information for the one or more devices in wireless communication on the wireless network~~; and

provide the formatted service usage information to the network accounting system; and

[[a]]memory coupled to the one or more processors and configured to provide the one or more processors with instructions.

2. (Previously presented) The system recited in claim 1, wherein the proxy network device includes a proxy server.

3. (Previously presented) The system recited in claim 1, wherein the proxy network device includes a proxy router.

4. (Currently amended) The system recited in claim 1, wherein the wireless network is a first wireless network, and wherein the proxy network device is configured to support the particular service activity over a second ~~provides a common network service between two or more~~ wireless access network[[s]].

5. (Currently amended) The system recited in claim 1, further comprising ~~wherein the proxy network device is programmed using~~ a ~~centralized~~ service design interface configured to assist in programming the one or more processors to implement a service policy.

6. (Currently amended) The system recited in claim 1, wherein the one or more processors are configured to obtain the service usage information ~~includes network~~ by generating the service usage information.

7. (Previously presented) The system recited in claim 1, wherein the syntax is a charging data record (CDR).

8. (Currently amended) The system recited in claim 1, wherein the one or more processors are configured to obtain the service usage information ~~includes network service usage information~~ from the device.

9. (Previously presented) The system recited in claim 1, wherein the proxy network device includes a service usage data store.

10. (Currently amended) The system recited in claim 1, wherein the proxy network device includes a service usage data store and a rules engine for aggregating the ~~collected device generated~~ service usage information.

11. (Currently amended) The system recited in claim 1, ~~wherein the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and~~ wherein the one or more processors [[is]]are ~~further~~ configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating[[e]] the service usage information ~~device assisted CDRs for the one or more devices in wireless communication on the wireless network~~; and

applying a set of rules to the aggregated service usage information ~~CDRs using a rules engine~~.

12. (Currently amended) The system recited in claim 1, wherein the syntax is a charging data record (CDR), ~~and the proxy network device includes a CDR feed aggregator,~~ and wherein the one or more processors are[[is]] ~~further~~ configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating[[e]] the service usage information ~~device assisted CDRs for the one or more devices in wireless communication on the wireless network~~; and

applying a set of rules to the aggregated service usage information ~~device assisted CDRs using a rules engine~~;

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating[[e]] a [[new]]set of one or more CDRs ~~for the one or more devices in wireless communication on the wireless network~~ to the[[a]] network accounting ~~billing interface or a billing~~ system.

13. (Currently amended) The system recited in claim 1, wherein the syntax is a charging data record (CDR), ~~and the proxy network device includes a CDR feed aggregator,~~ and wherein the one or more processors are[[is]] ~~further~~ configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating[[e]] the service usage information ~~device assisted CDRs for the one or more devices in wireless communication on the wireless network~~; and

verifying the aggregated service usage information ~~device assisted CDRs~~;

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating[[e]] a ~~new~~ set of one or more CDRs ~~for the one or more devices in wireless communication on the wireless network~~ to the network accounting ~~a billing interface or a billing~~ system.

14. (Currently amended) The system recited in claim 1, wherein the syntax is a charging data record (CDR), ~~and the proxy network device includes a CDR feed aggregator,~~ and wherein the one or more processors are[[is]] ~~further~~ configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating[[e]] the service usage information ~~device assisted CDRs for the one or more devices in wireless communication on the wireless network~~; and

verifying the aggregated service usage information ~~device assisted CDRs~~ by comparing at least a subset of the aggregated service usage information ~~device assisted CDRs~~ to ~~a set of~~ at least one network generated CDR[[s]] ~~for the one or more devices in wireless communication on the wireless network~~;

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating[[e]] a [[new]]set of one or more CDRs associated with service usage for the ~~one or more~~ device[[s]] ~~in wireless communication on the wireless network~~ to the network accounting ~~billing interface or a billing~~ system ~~based on the verifying of the aggregated device assisted CDRs~~.

15. (Currently amended) The system recited in claim 1, wherein the syntax is a charging data record (CDR), ~~and the proxy network device includes a CDR feed aggregator,~~ and wherein the one or more processors are[[is]] ~~further~~ configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating[[e]] the service usage information ~~device assisted CDRs for the one or more devices in wireless communication on the wireless network~~; and

applying a set of at least one rule[[s]] to the aggregated service usage information ~~CDRs using a rules engine~~, wherein the set of at least one rule includes a bill by account rule;

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating[[e]] a [[new]]set of one or more CDRs ~~for the one or more devices in wireless communication on the wireless network~~ to a billing interface or a billing system.

16. (Currently amended) The system recited in claim 1, wherein the syntax is a charging data record (CDR), ~~and the proxy network device includes a CDR feed aggregator,~~ and wherein the

one or more processors are[[is]] ~~further~~ configured to format the service usage information into a syntax that can be used by a network accounting system by:

aggregating[[e]] the service usage information ~~device assisted CDRs for the one or more devices in wireless communication on the wireless network~~; and

applying a set of at least one rule[[s]] to the aggregated service usage information ~~device assisted CDRs using a rules engine~~, wherein the set of at least one rule includes a bill by account rule;

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating[[e]] a [[new]]set of one or more CDRs ~~for the one or more devices in wireless communication on the wireless network~~ to a billing interface or a billing system, wherein at least one of the one or more CDRs includes a billing offset.

17. (Currently amended) The system recited in claim 1, wherein the syntax is a charging data record (CDR), ~~and the network device includes a CDR feed aggregator,~~ and wherein the one or more processors are[[is]] ~~further~~ configured to format the service usage information into a syntax that can be used by a network accounting system by:

communicating[[e]] a [[new]]set of one or more CDRs ~~for the one or more devices in wireless communication on the wireless network~~ to the network accounting system, and wherein the network accounting system comprises ~~a billing interface or~~ a billing system.

18. (Currently amended) The system recited in claim 1, wherein the one or more processors are[[is]] further configured to ~~communicate with~~ provide a service controller function, and wherein the one or more processors are configured to obtain service usage information for the device by ~~to~~ collecting the ~~device generated~~ service usage information with assistance from the service controller function ~~for the one or more devices in wireless communication on the wireless network~~.

19. (Currently amended) The system recited in claim 1, wherein the network accounting system comprises ~~processor is further configured to:~~

~~communicate with~~ a service controller~~, wherein the service controller is in communication with a billing interface or a billing system, and wherein the service controller communicates the device generated service usage information to the network device~~.

20. (Currently amended) The system recited in claim 1, wherein the network accounting system comprises ~~processor is further configured to:~~

~~communicate the device generated service usage information to~~ a billing interface or a billing system.

21. (New) The system recited in claim 1, wherein the particular service activity is an activity associated with a particular application on the device.

22. (New) The system recited in claim 1, wherein the particular service activity is an activity associated with a source address or a destination address.

23. (New) The system recited in claim 1, wherein the particular service activity is an activity associated with a particular content type.

24. (New) The system recited in claim 1, wherein the particular service activity is an activity associated with a data socket, a communication end point, or a communication source.

25. (New) The system recited in claim 1, wherein the particular service activity is an activity that takes place at a particular time of day.

26. (New) The system recited in claim 1, wherein the particular service activity is an activity associated with a particular quality-of-service (QoS) parameter.

27. (New) The system recited in claim 1, wherein the particular service activity is an activity associated with a network busy state.

28. (New) The system recited in claim 1, wherein the particular service activity is an ambient service activity.

29. (New) They system recited in claim 1, further comprising the network accounting system, and wherein the network accounting system is configured to assist in allocating at least a portion of the formatted service usage information to an account associated with a sponsor entity, the sponsor entity being an entity other than a user of the device.

30. (New) The system recited in claim 29, wherein the network accounting system is further configured to assist in billing the sponsor entity.

31. (New) The system recited in claim 1, wherein the one or more processors are further configured to assist in controlling the traffic associated with the particular service activity.

32. (New) The system recited in claim 31, wherein the particular service activity is a roaming service activity.

33. (New) The system recited in claim 1, wherein the one or more processors are further configured to assist in controlling the traffic associated with the particular service activity by allowing the traffic associated with the particular service activity.

34. (New) The system recited in claim 1, wherein the one or more processors are further configured to assist in controlling the traffic associated with the particular service activity by blocking or limiting the traffic associated with the particular service activity.

35. (New) The system recited in claim 1, wherein the one or more processors are further configured to assist in controlling the traffic associated with the particular service activity based on a set of one or more rules.

36. (New) The system recited in claim 1, wherein the particular service activity is an ambient service activity, and wherein the one or more processors are further configured to impose a limit on the traffic associated with the ambient service activity.

37. (New) The system recited in claim 1, wherein the proxy network device resides in the wireless network.

38. (New) The system recited in claim 1, wherein the proxy network device resides in a partner server or a partner network.

39. (New) The system recited in claim 1, wherein the particular service activity is a roaming service activity, and wherein the one or more processors are further configured to assist in implementing a policy associated with the roaming service activity.

40. (New) The system recited in claim 1, wherein the proxy network device resides in a home wireless network, and wherein the particular service activity comprises a roaming service activity.

41. (New) The system recited in claim 1, further comprising the network accounting system, and wherein the network accounting system is configured to assist in allocating at least a portion of the service usage information to a user of the device.

42. (New) The system recited in claim 41, wherein the network accounting system is further configured to assist in billing the user.

43. (New) The system recited in claim 1, further comprising the network accounting system, and wherein the network accounting system is configured to assist in allocating a credit based at least in part on the service usage information.

44. (New) The system recited in claim 1, further comprising the network accounting system, and wherein the network accounting system is configured to reduce a service usage or service cost allocated to a user account based on a credit or an offset.

45. (New) The system recited in claim 1, wherein the particular logical channel comprises a tunnel or a secure link.

46. (New) The system recited in claim 1, wherein the particular logical channel is associated with side information.

47. (New) The system recited in claim 1, wherein at least one of the one or more processors is configured to assist in establishing the particular logical channel.

48. (New) The system recited in claim 1, wherein the particular logical channel comprises a secure channel between an agent or software on the device and the proxy network device.

49. (New) The system recited in claim 1, wherein at least one of the one or more processors is configured to assist in implementing an accounting policy to account for the particular service activity.

50. (New) The system recited in claim 1, wherein at least one of the one or more processors is configured to assist in implementing a traffic control policy.

51. (New) The system recited in claim 1, wherein at least one of the one or more processors is configured to assist in identifying the traffic associated with the particular service activity.

52. (New) The system recited in claim 1, wherein at least one of the one or more processors is configured to assist in identifying traffic that is not associated with the particular service activity.

53. (New) The system recited in claim 1, wherein at least one of the one or more processors is configured to assist in routing or directing traffic associated with the particular service activity to the particular logical channel.

54. (New) The system recited in claim 1, wherein the processor of the proxy network device is configured to generate the service usage information.

55. (New) The system recited in claim 7, wherein the CDR includes information about an amount of usage.

56. (New) The system recited in claim 7, wherein the CDR includes information about one or more of: an application, an application type, a domain, a website, a traffic type, a traffic class, a communication end point, a source or destination, a socket, an address, a quality of service (QoS), a protocol, a transaction, and a uniform resource locator (URL).

57. (New) The system recited in claim 1, wherein the one or more processors are configured to format the service usage information into a syntax that can be used by a network accounting system for service usage accounting by:

aggregating the service usage information, and

verifying the aggregated service usage information by comparing the service usage information to a limit,

and wherein the one or more processors are configured to provide the formatted service usage information to the network accounting system by communicating a set of one or more CDRs to the network accounting system.

REMARKS

Claims 1-20 are pending and were rejected in the Office Action mailed on March 1, 2012. Claims 1, 4-6, 8, and 10-20 are being amended. Claims 21-57 are being added. No new matter is being added. Reconsideration is respectfully requested.

Support for Claim Amendments and New Claims

Because the paragraph numbering differs between the as-filed application and the published application, Applicant is providing the paragraph numbers both of the as-filed application and the published application.

The amendments to claim 1 are supported at least by as-filed paragraph [0056], publication paragraph [0086] (service usage information collection, aggregation, mediation, and reporting function located in one or more networking equipment components, such as AAA server 121, wireless center/home location register (HLR) 132, base station 125, etc.); as-filed paragraph [00147], publication paragraph [00177] (connection between network system and device can be TLS/SSL (transport layer security/secure sockets layer), or secure tunnel); as-filed paragraph [00140], publication paragraph [00170] (disclosing routing different service traffic to different proxy servers or proxy routers; usage accounting provided by proxy servers or routers is used directly for service usage accounting); as-filed paragraph [00143], publication paragraph [00173] (traffic destined for given service is routed to proxy server or router programmed to support that service; proxy server or router can be programmed to allow access only to one or more services authorized by device service plan, with proxy server or router controlling device access so other network destinations cannot be reached); as-filed paragraph [00126], publication paragraph [00156] (service processor detects one or more types of service activity and routes traffic to appropriate proxy server destination for that activity); and as-filed paragraph [00148], publication paragraph [00178] (proxy server/router reports service charging bucket accounting to service controller or other network equipment responsible for service charging bucket/micro CDR mediation; mediation functions can be performed by one or more of service controller, usage mediation, billing, AAA, and/or HLR/home agent).

The amendments to claim 4 are supported at least by as-filed paragraph [00161], publication paragraph [00191] (one or more proxy servers or routers used to create a common network service between two or more different networks).

The amendments to claim 5 are supported at least by as-filed paragraph [00152], publication paragraph [00182] (service design interface used to program necessary policy settings for ambient services, user service plan services, and/or specialized services).

The amendments to claim 6 are supported at least by as-filed paragraph [00140], publication paragraph [00170] (usage accounting provided by proxy servers or routers used directly for service usage accounting); and as-filed paragraph [00145], publication paragraph [00175] (accounting reported by proxy server or router can be used directly to account for service usage).

The amendments to claim 8 are supported at least by as-filed paragraph [0033], publication paragraph [0033] (charging data record (CDR) defines formatted measure of device service usage information, typically generated by one or more network functions or device functions that supervise, monitor, control, account for, charge for, report, synchronize usage accounting or records and/or bill for network access or other service or purchase transactions for device).

The amendments to claim 10 are supported at least by as-filed paragraph [0056], publication paragraph [0086] (CDR storage, aggregation, mediation, feed 118 (e.g., service usage 118, includes billing aggregation data store and rules engine; CDR storage, aggregation, mediation, feed 118 a functional descriptor for device/network level service usage information collection, aggregation, mediation, and reporting function located in one or more networking equipment components).

The amendments to claims 11 and 12 are supported at least by as-filed paragraph [0037], publication paragraph [0051] (CDR creation typically includes using one or more measures of service usage, possibly processing one or more of such service usage measures using set of rules to arrive at usage measure that is formatted with proper syntax, framed, possibly encrypted and/or signed, and encapsulated in communication protocol or packet suitable for sharing with

network functions); and as-filed paragraph [0049], publication paragraph [0079] (service controller uses CDR feed aggregator to collect device generated usage information for one or more devices on the wireless network; and provides the device generated usage information in a syntax (e.g., charging data record (CDR)), and a communication protocol (e.g., 3GPP or 3GPP2, or other communication protocol(s)) that can be used by wireless network).

The amendments to claim 13 are supported at least by as-filed paragraph [0037], publication paragraph [0051] (process of CDR creation typically includes using one or more measures of service usage, possibly processing one or more of such service usage measures according to set of rules to arrive at final device usage measure that is then formatted with proper syntax, framed, possibly encrypted and/or signed, and encapsulated in communication protocol or packet suitable for sharing with network functions); and as-filed paragraph [0049], publication paragraph [0079] (service controller uses CDR feed aggregator to collect device generated usage information for one or more devices on wireless network and provides device generated usage information in syntax (e.g., charging data record (CDR)), and communication protocol (e.g., 3GPP or 3GPP2, or other communication protocol(s)) that can be used by wireless network); and as-filed paragraph [00140], publication paragraph [00170] (different proxy servers/routers used for different services; by comparing service usage accounting for each proxy server or router, device generated service charging bucket accounting can be verified).

The amendments to claim 14 are supported at least by as-filed paragraph [0057], publication paragraph [0087] (CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) includes service usage data store (e.g., billing aggregator) and rules engine for aggregating collected device generated usage information; syntax is charging data record (CDR), and network device is CDR feed aggregator, and CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) also aggregates CDRs for one or more devices on the wireless network and applies rules to aggregated CDRs using rules engine (e.g., bill by account, transactional billing, and/or any other billing or other rules for service usage information collection, aggregation, mediation, and reporting), and communicates new set of CDRs to billing interface or billing system); and as-filed paragraph [0075], publication paragraph [00105]

(network generated CDRs used for verification of device assisted service (DAS) usage and/or billing information).

The amendments to claim 15 are supported at least by as-filed paragraph [0057], publication paragraph [0087] (CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) includes service usage data store (e.g., a billing aggregator) and rules engine for aggregating collected device generated usage information; syntax is charging data record (CDR), and network device is CDR feed aggregator, and CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) also aggregates CDRs for one or more devices on wireless network and applies rules to aggregated CDRs using rules engine (e.g., bill by account, transactional billing, and/or any other billing or other rules for service usage information collection, aggregation, mediation, and reporting), and communicates new set of CDRs to billing interface or billing system).

The amendments to claim 16 are supported at least by as-filed paragraph [0057], publication paragraph [0087] (CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) includes service usage data store (e.g., a billing aggregator) and rules engine for aggregating collected device generated usage information; syntax is charging data record (CDR), and network device is CDR feed aggregator, and CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) also aggregates CDRs for one or more devices on wireless network and applies rules to aggregated CDRs using rules engine (e.g., bill by account, transactional billing, and/or any other billing or other rules for service usage information collection, aggregation, mediation, and reporting), and communicates new set of CDRs to billing interface or billing system); and as-filed paragraph [0048], publication paragraph [0078] (CDR can include various types of transaction codes including raw device usage CDR, a bill-by-account (e.g., sub-activity transaction code) CDR, billing offset CDR, and/or billing credit CDR).

The amendments to claim 17 are supported at least by as-filed paragraph [0057], publication paragraph [0087] (syntax is charging data record (CDR), and CDR feed aggregator,

and CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) aggregates CDRs for one or more devices on wireless network and applies rules to aggregated CDRs using rules engine (e.g., bill by account, transactional billing, and/or any other billing or other rules for service usage information collection, aggregation, mediation, and reporting), and communicates new set of CDRs to billing interface or billing system).

The amendments to claims 18 and 19 are supported at least by as-filed paragraph [0049], publication paragraph [0079] (device assisted service measures provided to service controller; service controller uses CDR feed aggregator to collect usage information for one or more devices on wireless network; service controller provides device generated usage information in syntax (e.g., charging data record (CDR)), and communication protocol (e.g., 3GPP or 3GPP2, or other communication protocol(s)) that can be used by wireless network).

The amendments to claim 20 are supported at least by as-filed paragraph [0057], publication paragraph [0087] (CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) communicates new set of CDRs to billing interface or billing system).

Claim 21 is supported at least by as-filed paragraph [00105], publication paragraph [00135] (providing activity map for classifying or categorizing service usage activities to associate various monitored activities (e.g., by URL, by network domain, by website, by network traffic type, by application or application type, and/or any other service usage activity categorization/classification) with associated IP addresses).

Claim 22 is supported at least by as-filed paragraph [00138], publication paragraph [00168] (describing use of network generated service usage records to directly verify service charging and/or proper service usage policy; when network address destination and/or source information is available, it can be used to verify service charging bucket accounting).

Claim 23 is supported at least by as-filed paragraph [00144], publication paragraph [00174] (traffic control service policy implemented by proxy server can control traffic based on content type).

Claim 24 is supported at least by as-filed paragraph [00149], publication paragraph [00179] (in some proxy server/router embodiments, usage credit is sometimes recorded by proxy server/router detecting which device is performing access; device identification can be accomplished based on unique proxy server/router address and/or socket for device); as-filed paragraph [0034], publication paragraph [0038] (usage measures involve encrypted traffic (e.g., traffic that is run over encrypted networking protocols or between secure end points)); as-filed paragraph [0034], publication paragraph [0047] (usage measures indicate content downloads from specific source to specific application with the content being of specific type or even identified down to particular content ID).

Claim 25 is supported at least by as-filed paragraph [00144], publication paragraph [00174] (traffic control service policy implemented by proxy server can control traffic based on time of day).

Claim 26 is supported at least by as-filed paragraph [00144], publication paragraph [00174] (traffic control service policy implemented by proxy server can control traffic based on QoS class); as-filed paragraph [0033], publication paragraph [0033] (usage records include usage information identifying QoS level, QoS class, and/or other QoS classifier).

Claim 27 is supported at least by as-filed paragraph [00144], publication paragraph [00174] (traffic control service policy implemented by proxy server can control traffic based on network busy state).

Claim 28 is supported at least by as-filed paragraph [00140], publication paragraph [00170] (ambient service traffic routed to proxy server or router programmed to support only network access allowed for ambient service and to account for ambient service usage).

Claims 29 and 30 are supported at least by as-filed paragraph [00103], publication paragraph [00133] (device starts with ambient services that include free transaction services wherein user pays for transactions or events rather than basic service (e.g., news service, eReader, PND service, pay as you go session Internet) in which each service is supported with bill by account capability to correctly account for any subsidized partner billing to provide

transaction services (e.g., Barnes and Noble may pay for eReader service and offer revenue share to service provider for any book or magazine transactions purchased from device)).

Claim 31 is supported at least by as-filed paragraph [00128], publication paragraph [00158] (one or more proxy servers or routers used for controlling service usage in accordance with set of policies); and as-filed paragraph [00143], publication paragraph [00173] (proxy server or router embodiments can also implement user service plan service charging buckets, user service plan traffic controls, and user service plan access control).

Claim 32 is supported at least by as-filed paragraph [00153], publication paragraph [00183] (service controller 120, service processor 115, and/or proxy sever router 270 used to provide unified roaming services or common network service features across different networks).

Claim 33 is supported at least by as-filed paragraph [00132], publication paragraph [00162] (if web site access does not have reference identifier or other traffic parameter that allows service processor to associate it with correct ambient service, set of rules can be applied to determine if it is likely that web site access is legitimate given access control policies in place, and if it is, access can be allowed); and as-filed paragraph [00143], publication paragraph [00173] (proxy server or router embodiments can implement user service plan service charging buckets, user service plan traffic controls, and user service plan access control).

Claim 34 is supported at least by as-filed paragraph [00141], publication paragraph [00171] (if transactions are recorded, this can be reported to service controller and amount of ambient service used by device can be compared with number of transactions completed to determine if ambient service usage is reasonable or should be throttled or blocked); as-filed paragraph [00142], publication paragraph [00172] (access control policy rules call for restricting ambient service access when amount of service usage charges accumulating in ambient service charging bucket exceeds pre-set policy limit, and/or when rate of service usage for ambient service exceeds pre-set policy limit; once limits are reached, ambient service can be throttled back for period of time, blocked for period of time, or charged to user service plan charging bucket); and as-filed paragraph [00143], publication paragraph [00173] (proxy server or router embodiments can implement user service plan service charging buckets, user service plan traffic controls, and user service plan access control).

Claim 35 is supported at least by as-filed paragraph [00132], publication paragraph [00162] (if web site access associated with ambient service does not have reference identifier or other traffic parameter that allows service processor to associate it with correct ambient service, set of rules can be applied to determine if it is likely that web site access is legitimate given access control policies in place, and if it is, access can be allowed and traffic usage either recorded in ambient service charging bucket that it is suspected to be associated with, or traffic usage can be charged to network chatter service usage bucket, or traffic usage can be charged to user service usage bucket, or traffic usage may be recorded in "not classified but allowed" service charging bucket); and as-filed paragraph [00143], publication paragraph [00173] (proxy server or router embodiments can implement user service plan service charging buckets, user service plan traffic controls, and user service plan access control).

Claim 36 is supported at least by as-filed paragraph [00142], publication paragraph [00172] (access control policy rules call for restricting ambient service access when amount of service usage charges accumulating in ambient service charging bucket exceeds pre-set policy limit, and/or when rate of service usage for ambient service exceeds pre-set policy limit; once limits are reached, ambient service can be throttled back for period of time, blocked for period of time, or charged to user service plan charging bucket); and as-filed paragraph [00143], publication paragraph [00173] (proxy server or router embodiments can also implement user service plan service charging buckets, user service plan traffic controls, and user service plan access control).

Claim 37 is supported at least by Figures 16-20 and 22-23 (showing proxy server/router 270 as a network element); and as-filed paragraph [00143], publication paragraph [00173] (proxy server or router embodiments can implement user service plan service charging buckets, user service plan traffic controls, and user service plan access control).

Claim 38 is supported at least by as-filed paragraph [00141], publication paragraph [00171] (ambient service partner feedback used to verify service charging bucket accounting; web servers used by ambient service partners to provide ambient services can identify user device based on header information embedded in HTML traffic and account for either service used by device during ambient service sessions or account for number of transactions user

completes; service usage can be reported to service controller and used directly to verify ambient service charging bucket accounting); and as-filed paragraph [00143], publication paragraph [00173] (proxy server or router embodiments can implement user service plan service charging buckets, user service plan traffic controls, and user service plan access control).

Claim 39 is supported at least by as-filed paragraph [00156], publication paragraph [00186] (service techniques using service processor and/or service controller, including, for example, service usage charging, QoS enabled service usage charging, service usage notification, service usage control, and service usage user feedback UI apply to improving roaming services or unifying different service provider networks with common service).

Claim 40 is supported at least by as-filed paragraph [00153], publication paragraph [00183] (network equipment, charging record formats, provisioning systems can be similar in two networks, or may be completely different since in various embodiments service controller 120, service processor 115, and/or proxy sever router 270 are used to provide unified roaming services, or in some embodiments, to provide common network service features across different networks); as-filed paragraph [00157], publication paragraph [00187] (possible to interface common set of service controller capabilities, service processor capabilities, proxy server and/or router capabilities and/or service design interface capabilities into different networks that have different equipment and even different communication protocols for provisioning equipment, CDR collection and aggregation equipment, traffic control equipment, AAA, home agent/HLR, billing systems, QoS reservation and control equipment, and/or other capabilities/protocols); and as-filed paragraph [0039], publication paragraph [0066] (collecting CDRs generated on networks other than home network so that service usage may be measured, accounted for, and/or billed for across multiple networks).

Claims 41 and 42 are supported at least by as-filed paragraph [00134], publication paragraph [00164] (for given service plan, there can be two ambient service charging buckets, network chatter (e.g., or network overhead) service charging bucket, and user service plan service charging bucket; desirable to make sure that no ambient services or network overhead service or unclassified service is charged to user service plan; desirable to ensure that all known ambient service traffic is charged to appropriate ambient service partner; desirable to ensure that

no network overhead service or unclassified service is charged to ambient service partners); and as-filed paragraph [00136], publication paragraph [00166] (user service plan account can be charged and/or billed with some traffic).

Claim 43 is supported at least by as-filed paragraph [00148], publication paragraph [00178] (credit for ambient service or other specialized access service usage that is not charged to user is provided for services that device directs through proxy server/router destination (e.g., URL or route hop) supporting particular ambient service or other specialized access service).

Claim 44 is supported at least by as-filed paragraph [0048], publication paragraph [0078] (CDR can include various types of transaction codes including raw device usage CDR, a bill-by-account (e.g., sub-activity transaction code) CDR, billing offset CDR, and/or billing credit CDR); and as-filed paragraph [00148], publication paragraph [00178] (credit for ambient service or other specialized access service usage that is not charged to user is provided for services that device directs through proxy server/router destination (e.g., URL or route hop) supporting particular ambient service or other specialized access service).

Claim 45 is supported at least by as-filed paragraph [00147], publication paragraph [00177] (standard network connection can be secure (e.g., TLS/SSL, or a secure tunnel); side information available on device can be communicated to proxy server/router by associating given secure link or tunnel with side information).

Claims 46 and 47 are supported at least by as-filed paragraph [00147], publication paragraph [00177] (information available on device can be communicated to proxy server/router and associated with traffic flows or service usage activities as side information; side information available on device can be communicated to proxy server/router by associating given secure link or tunnel with side information).

Claim 48 is supported at least by as-filed paragraph [0086], publication paragraph [00116] (communication link between service control server link 1638 of service controller 122 and service control device link 1691 of service processor 115 can provide efficient and flexible control plane communication link (service control link 1653 as shown in Figure 9); in some embodiments, control plane communication link provides for secure (e.g., encrypted)

communications link for providing secure, bidirectional communications between service processor 115 and service controller 122; service control server link 1638 provides network side of system for transmission and reception of service agent to/from network element functions); and as-filed paragraph [0097], publication paragraph [00127] (service download control server 1660 provides download function to install and/or update service software elements (e.g., service processor 115 and/or agents/components of service processor 115) on device).

Claim 49 is supported at least by as-filed paragraph [0081], publication paragraph [00111] (charging records that include QoS tags are used to verify QoS policy adherence in the device; charging records that include QoS tags are used to verify QoS policy adherence in other network elements (e.g., proxy router or server, other network elements that reserve, establish, provision or control QoS channels); QoS policies being verified include QoS accounting policy).

Claim 50 is supported at least by as-filed paragraph [00143], publication paragraph [00173] (proxy server or router embodiments can also implement user service plan traffic controls and user service plan access control).

Claim 51 is supported at least by as-filed paragraph [00143], publication paragraph [00173] (incoming traffic associated with ambient service website or other service identified, allowed or blocked, potentially throttled, and accounted for can be implemented in proxy server or router programming).

Claim 52 is supported at least by as-filed paragraph [00148], publication paragraph [00178] (hierarchy of service usage charging rules can be applied to proxy server or proxy router embodiments; charging bucket embodiments and traffic control and access control embodiments for allowed but not classified buckets apply equally to proxy server/router embodiments); and as-filed paragraph [00132], publication paragraph [00162] (there may be web site access associated with ambient service does not have reference identifier or other traffic parameter that allows service processor to associate it with correct ambient service; set of rules can be applied to determine if it is likely that web site access is legitimate given access control policies in place, and if it is, access can be allowed and traffic usage either recorded in ambient service charging bucket that it is suspected to be associated with, or traffic usage can be charged to network

chatter service usage bucket, or traffic usage can be charged to user service usage bucket, or traffic usage may be recorded in a "not classified but allowed" service charging bucket).

Claim 53 is supported at least by as-filed paragraph [00144], publication paragraph [00174] (routing of device traffic to proxy server or router accomplished by dedicated network equipment such as gateways (e.g., SGSN, GGSN, PDSN, or PDN), home agents, HLRs or base stations, with network equipment being provisioned by service controller (e.g., or other interchangeable network element with similar functions for this purpose) to direct device traffic to proxy server or router).

Claim 54 is supported at least by as-filed paragraph [00145], publication paragraph [00175] (accounting reported by proxy server or router can be used directly to account for service usage, such as ambient service usage or user service plan service usage).

Claim 55 is supported at least by as-filed paragraph [0033], publication paragraph [0033] (charging data record (CDR) defines formatted measure of device service usage information).

Claim 56 is supported at least by as-filed paragraph [0033], publication paragraph [0033] (charging data records (CDRs) include record types that include usage information identifying QoS level, QoS class, and/or other QoS classifier, records that include usage information identifying traffic type or class or other traffic identifier, records that identify traffic protocol, records that identify usage or purchase transactions, records that report a purchase transaction, etc.; term CDR is used interchangeably with one or more of other industry terms or record types including, for example, flow data records (FDRs)); as-filed paragraph [00113], publication paragraph [00143] (traffic or service activity classification relies on traffic attributes that are readily obtainable, such as source address or URL, application socket address, IP destination address); as-filed paragraph [00138], publication paragraph [00168] (network address destination and/or source information may be available in flow data records, which are detailed reports of service usage for each service flow); and as-filed paragraph [00105], publication paragraph [00135] (device activities monitored by URL, by network domain, by website, by network traffic type, by application, by application type, by IP address).

Claim 57 is supported at least by as-filed paragraph [0090], publication paragraph [00120] (access control integrity server 1654 (and/or some other agent of service controller 122) verifies device service policy implementations by comparing various service usage measures (e.g., based on network monitored information, such as by using IPDRs or CDRs, and/or local service usage monitoring information) against expected service usage behavior given policies intended to be in place); and as-filed paragraph [00138], publication paragraph [00168] (FDRs created each time new service flow (e.g., network socket connection) opened and then closed; at time service flow is closed, data usage record indicating source address, destination address and amount of data transmitted created and sent to charging aggregation function in network; charging aggregation function can forward FDRs to service controller for verification or direct accounting of service charging bucket accounting).

Claim Rejections – 35 U.S.C. § 103(a)

In section 3, the Office Action rejects claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over Koutsopoulou et al., entitled "Middleware Platform for the Support of Charging Reconfiguration Actions" (i.e., reference 3D from Applicant's Information Disclosure Statement (IDS) submitted on August 27, 2010) (hereinafter, "Koutsoupoulou") in view of Alonistioti et al., entitled "Intelligent Architectures Enabling Flexible Service Provision and Adaptability" (i.e., reference 2Q from Applicant's IDS submitted on August 27, 2010) (hereinafter, "Alonistioti").

Koutsopoulou describes the charging-related features of a proposed middleware platform to enable flexible service provisioning, flexible charging, customized billing, and reconfigurability control for cellular networks. (Abstract). In particular, Koutsopoulou proposes a "service provision middleware platform" (the "SPMP") that is accessible to entities that enter business agreements with a network operator for the purpose of being able to provide value-added services to users of cellular devices. Koutsopoulou refers to these entities as "value-added service providers" or "VASPs." Koutsopoulou discloses providing application programming interfaces to enable network operators to open their networks safely to VASPs while reducing the complexity involved in delivering applications developed by third parties over mobile networks. (p. 1, col. 1, l. 28 – col. 2, l. 6).

Within the SPMP are network-based metering devices that provide "filtering of IP traffic, monitoring of specific flows, metering of the associated data volume and [quality-of-service] provisioning." (p. 3, col. 2, ll. 19-22). The metering devices "are located at the edge of the connectivity network of the Network Access Provider so that they process all traffic between VASPs and users." (p. 3, col. 2, ll. 26-29). The metering devices "collect metering data only for flows specified in configuration policies." (p. 3, col. 2, ll. 32-34). The "collected metering data is formatted into appropriate records, the IP Data Records (IPDRs), and sent to the [charging, accounting, and billing module] for further processing." (p. 3, col. 2, ll. 37-39). The charging, accounting, and billing module "collects charging information, applies the appropriate pricing model, calculates the portions that are due to each business entity and produces a single itemised [sic] bill to each subscriber." (p. 4, col. 1, ll. 24-29).

Alonistioti identifies various requirements for service provision in next-generation networks and describes a software framework for advanced service deployment and management. (Abstract). The disclosures in Alonistioti are similar to those in Koutsopoulou. Indeed, the three authors Athanassia Alonistioti, Maria Koutsopoulou, and Spyridon Panagiotakis are listed on both papers, and Figure 1 of Alonistioti includes much of the content of Figure 1 of Koutsopoulou. Not surprisingly, the system described in Alonistioti has many of the same components as the system described in Koutsopoulou, including metering devices and a charging, accounting, and billing system.

Alonistioti's metering devices are enhanced IP routers that filter IP traffic, perform quality of service provisioning, and have "metering capabilities." The metering devices examine transport- and application-layer information as well as the network-layer data used by conventional IP routers. (p. 4, ll. 31-34). The functions of the metering devices "are applied selectively to specific transport flows." (p. 4, ll. 34-35). Like the metering devices in Koutsopoulou, the metering devices in Alonistioti "process all service usage traffic flows between VASPs and users." (p. 4, ll. 36-38). The charging, accounting, and billing system "collects charging information from both the standard elements of the mobile network (in the form of Charging Data Records (CDRs) and [metering devices] (in the form of Value-Added Service Data Records, VASDRs), applies the appropriate pricing model, calculates the portions

that are due to each business entity and produces a single itemised [sic] bill to each subscriber." (p. 4, ll. 51-55).

In rejecting claims 1-20, the Office Action states that Koutsopoulou discloses all of the limitations of the claims except augmenting or replacing network generated usage information for the one or more devices. The Office Action states that Alonistioti teaches augmenting or replacing network generated usage information for the one or more devices (e.g., page 2 discloses that a single bill should be generated per user for basic and value added services; and execute applications matching his/her needs as well as the current characteristics of the service provision context). The Office Action states that to have provided augmenting or replacing network generated usage information for a device along with the teachings of Koutsopoulou would have been obvious to one or ordinary skill in the art in view of Alonistioti, and that the motivation for having done so would have been to incorporate common knowledge technology for data records applications.

Claim 1

Claim 1 is being amended to recite:

> A system, comprising:
>
> one or more processors, including a processor of a proxy network device in communication with a device through a particular logical channel over a wireless network, the particular logical channel configured to support less than all data traffic associated with the device, the less than all data traffic including traffic associated with a particular service activity of a plurality of service activities available to the device, the one or more processors configured to:
>
> obtain service usage information for the device, the service usage information associated with the particular service activity;
>
> format the service usage information into a syntax that can be used by a network accounting system for service usage accounting; and
>
> provide the formatted service usage information to the network accounting system; and

memory coupled to the one or more processors and
configured to provide the one or more processors with instructions.

Applicant respectfully submits that claim 1, as amended, is nonobvious over Koutsopoulou in view of Alonistioti because neither Koutsopoulou nor Alonistioti discloses, contemplates, or suggests "one or more processors, including a processor of a proxy network device in communication with a device through a particular logical channel over a wireless network, the particular logical channel configured to support less than all data traffic associated with the device, the less than all data traffic including traffic associated with a particular service activity of a plurality of service activities available to the device." First, although Koutsopoulou and Alonistioti disclose various components of the SPMP, neither Koutsopoulou nor Alonistioti discloses or even suggests the presence of a proxy network device anywhere in the system. Thus, Applicant respectfully submits that neither Koutsopoulou nor Alonistioti, nor the combination of Koutsopoulou and Alonistioti, discloses or makes obvious a processor of a proxy network device in communication with a device.

Second, neither Koutsopoulou nor Alonistioti discloses any processor of any network device in communication with a device through a particular logical channel over a wireless network, the particular logical channel configured to support less than all traffic associated with the device. On the contrary, both Koutsopoulou and Alonistioti disclose that *all* traffic is available to the metering devices. *See, e.g.*, Koutsopoulou at p. 3, col. 2, ll. 26-29 (metering devices "are located at the edge of the connectivity network of the Network Access Provider so that *they process all traffic between VASPs and users*.") (emphasis added); Alonistioti at p. 4, ll. 36-38 (metering devices "are located at the edge of the mobile network (thus, they reside in the administrative domain of the mobile operator), so that *they process all service usage traffic flows between VASPs and users*") (emphasis added). Consequently, even if Koutsopoulou and Alonistioti disclose that the metering devices process traffic carried over a particular logical channel, that logical channel is configured to support *all* traffic associated with a device, not less than all traffic associated with the device.

Third, because neither Koutsopoulou nor Alonistioti discloses the particular logical channel configured to support less than all traffic associated with the device, it follows that

neither Koutsopoulou nor Alonistioti discloses, contemplates, or suggests the less than all data traffic including traffic associated with a particular service activity of a plurality of service activities available to the device.

Thus, Applicant respectfully submits that neither Koutsopoulou nor Alonistioti, nor the combination of Koutsopoulou and Alonistioti, discloses, contemplates, or suggests "one or more processors, including a processor of a proxy network device in communication with a device through a particular logical channel over a wireless network, the particular logical channel configured to support less than all data traffic associated with the device, the less than all data traffic including traffic associated with a particular service activity of a plurality of service activities available to the device." For at least these reasons, Applicant respectfully submits that claim 1 is nonobvious over Koutsopoulou in view of Alonistioti, and Applicant therefore requests that the 35 U.S.C. § 103(a) rejection be withdrawn.

Claims 2-57

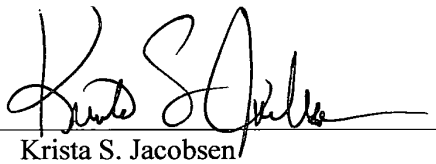
Claims 2-57 depend, directly or indirectly, from claim 1. Therefore, Applicant respectfully submits that claims 2-57 are nonobvious over Koutsopoulou in view of Alonistioti for at least the same reasons that claim 1 is nonobvious over Koutsopoulou in view of Alonistioti. Thus, Applicant respectfully requests that the 35 U.S.C. § 103(a) rejections be withdrawn.

CONCLUSION

Applicant respectfully requests entry of these amendments as provided herein. The application is believed to be in condition for allowance, and a Notice of Allowance is hereby respectfully requested. If the Examiner has any questions or needs any additional information, the Examiner is invited to contact the undersigned.

The Commissioner is authorized to charge any fee deficiency or credit any overpayment to Deposit Account 50-5876.

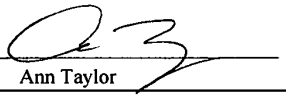
Respectfully submitted,

Date: Sep. 4, 2012 By: 

Krista S. Jacobsen
Reg. No. 59,374
Head Counsel
Headwater Partners I LLC
350 Marine Parkway, Suite 300
Redwood Shores, CA 94065
(650) 517-2798

CERTIFICATE OF ELECTRONIC TRANSMISSION

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being filed electronically via EFS-Web addressed to the Commissioner for Patents on:

Date: Sep. 4, 2012 By: 
Ann Taylor

PTO/SB/22 (09-11)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) RALEP030 [26WV-160507]
Application Number 12/695,980	Filed January 27, 2010
For Enhanced Roaming Services & Converged Carrier Networks With Device Assisted Services & a Proxy	
Art Unit 3687 Conf. No. 8973	Examiner Andrew J. Rudy

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	$150	$75	$
☐ Two months (37 CFR 1.17(a)(2))	$560	$280	$
☑ Three months (37 CFR 1.17(a)(3))	$1270	$635	$ 635.00
☐ Four months (37 CFR 1.17(a)(4))	$1980	$990	$
☐ Five months (37 CFR 1.17(a)(5))	$2690	$1345	$

☑ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-5876.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

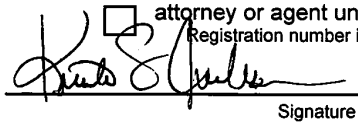
I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration Number 59374

☐ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____



Signature — September 4, 2012 (Date)

Krista S. Jacobsen (Typed or printed name) — 650-517-2798 (Telephone Number)

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal

Application Number:	12695980
Filing Date:	28-Jan-2010
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	Krista Susan Jacobsen/Ann Taylor
Attorney Docket Number:	RALEP030 [26WV-160507]

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Claims in excess of 20	2202	37	30	1110
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	2253	1	635	635
Miscellaneous:				
		Total in USD ($)		**1745**

Electronic Acknowledgement Receipt	
EFS ID:	13655194
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	107265
Filer:	Krista Susan Jacobsen/Ann Taylor
Filer Authorized By:	Krista Susan Jacobsen
Attorney Docket Number:	RALEP030 [26WV-160507]
Receipt Date:	04-SEP-2012
Filing Date:	28-JAN-2010
Time Stamp:	18:08:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1745
RAM confirmation Number	6284
Deposit Account	505876
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees) Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees) Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	1Trans.pdf	298517 3f77502c15b02dff2c85e19ee4c445ee6947efb1	no	1
Warnings:					
Information:					
2		2Amend.pdf	357299 74313f93a5af30478826fc966a502262e6176045	yes	29

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	11
Applicant Arguments/Remarks Made in an Amendment	12	29

Warnings:					
Information:					
3	Extension of Time	3Ext.pdf	305302 ff333a8460c507b45fc35291b254b72b04949fb1	no	1
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	32648 fad8e5ed7ef8a83b152a08cdea0fe3e6436bf216	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	993766		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: TRAN.LET

Document Description: Transmittal Letter

PTO/SB/21 (07-09)
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	31

Application Number	12/695,980
Filing Date	January 28, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687 Conf. No.: 8973
Examiner Name	Andrew J. Rudy
Attorney Docket Number	RALEP030 [26WV-160507]

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☑ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☑ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please identify below):

Remarks

You are hereby authorized to charge any additional fee required or credit any overpayment to Deposit Account No. 50-5876.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Headwater Partners I LLC		
Signature			
Printed name	Krista S. Jacobsen		
Date	September 4, 2012	Reg. No.	59374

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature			
Typed or printed name	Ann Taylor	Date	September 4, 2012

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 12/695,980	Filing Date 01/28/2010	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	09/04/2012	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 57	Minus	** 20	= 37	X $ =		OR	X $60=	2220
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $ =		OR	X $250=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	**2220**

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DEBRA R. WYATT/

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PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	12695980
Filing Date	2010-01-28
First Named Inventor	Raleigh, Gregory G.
Art Unit	3687
Examiner Name	Rudy, Andrew J
Attorney Docket Number	RALEP030

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5794142		1998-08-11	Vanttila, Jaakko et al.	
	2	5903845		1999-05-11	Buhrmann, Michael et al.	
	3	5933778		1999-08-03	Buhrmann, Michael et al.	
	4	6078953		2000-06-20	Vaid, Aseem et al.	
	5	6317584		2001-11-13	Abu-Amara, Hosame et al.	
	6	6418147		2002-07-09	Wiedeman, Robert A	
	7	6765864		2004-07-20	Natarajan, Shankar et al.	
	8	6829596		2004-12-07	Frazee, Steve	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

	9	7024200		2006-04-04	McKenna, Daniel B. et al.	
	10	7366497		2008-04-29	Nagata, Hideaki	
	11	7388950		2008-06-17	Elsey, Nicholas J. et al.	
	12	7450927		2008-11-11	Creswell, Carroll W. et al.	
	13	7499537		2009-03-03	Elsey, Nicholas J. et al.	
	14	7610328		2009-10-27	Haase, Oliver et al.	
	15	7620162		2009-11-17	Aaron, Jeffrey A. et al.	
	16	7650137		2010-01-19	Jobs, Steven P. et al.	
	17	7693720		2010-04-06	Kennewick, Robert A. et al.	
	18	7734784		2010-06-08	Araujo, Wladimir et al.	
	19	7747699		2010-06-29	Prueitt, James K. et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

	20	7792708		2010-09-07	Alva, Jessi	
	21	7797401		2010-09-14	Stewart, Hugh Donal et al.	
	22	7822837		2010-10-26	Urban, Mark et al.	
	23	7949529		2011-05-24	Weider, Chris et al.	
	24	8023425		2011-09-20	Raleigh, Gregory G.	
	25	8095666		2012-01-10	Schmidt, Jonathan E. et al.	
	26	8099077		2012-01-17	Chowdhury, Amor et al.	
	27	8099517		2012-01-17	Jia, Lujun R. et al.	
	28	8170553		2012-05-01	Bennett, James D.	
	29	7984130		2011-07-19	Bogineni, Kalyani et al.	
	30	8019687		2011-09-13	Wang, Feng Chi et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

	31	8144591		2012-03-27	Ghai, Rajat et al.	
	32	7336960		2008-02-26	Zavalkovsky, Arthur et al.	
	33	8194549		2012-06-05	Huber, Kurt Donald et al.	
	34	6606744		2003-08-12	Mikurak, Michael G.	
	35	8190675		2012-05-29	Tribbett, David	
	36	8200775		2012-06-12	Moore, James F.	
	37	7069248		2006-06-27	Huber, Adriano	
	38	6574465		2003-06-03	Marsh, William et al.	

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
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	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
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	Attorney Docket Number	RALEP030

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20030013434		2003-01-16	Rosenberg, Dave H. et al.	
	2	20030018524		2003-01-23	Fishman, Dan et al.	
	3	20030046396		2003-03-06	Richter, Roger K.	
	4	20030220984		2003-11-27	Jones, Paul David et al.	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

	6	20040107360		2004-06-03	Herrmann, Conrad K. et al.	
	7	20040249918		2004-12-09	Sunshine, Roger N.	
	8	20050048950		2005-03-03	Morper, Hans-Jochen	
	9	20060112016		2006-05-25	Ishibashi, Yoshihito	
	10	20060258341		2006-11-16	Miller, Quentin S.C. et al.	
	11	20070061243		2007-03-15	Ramer, Jorey et al.	
	12	20070282896		2007-12-06	Wydroug, Zoe M. et al.	
	13	20080010452		2008-01-10	Holtzman, Michael et al.	
	14	20080060066		2008-03-06	Wynn, Simon et al.	
	15	20080062900		2008-03-13	Rao, Bindu Rama	
	16	20080164304		2008-07-10	Narasimhan, Subram et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

	17	20080184127		2008-07-31	Rafey, Richter A. et al.	
	18	20080207167		2008-08-28	Bugenhagen, Michael K.	
	19	20080221951		2008-09-11	Stanforth, Peter	
	20	20080311885		2008-12-18	Dawson, Christopher James et al.	
	21	20080319879		2008-12-25	Carroll, Jim et al.	
	22	20090005005		2009-01-01	Forstall, Scott et al.	
	23	20090013157		2009-01-08	Beaule, Stephane	
	24	20090068984		2009-03-12	Burnett, R. Alan	
	25	20090079699		2009-03-26	SUN, JIAN	
	26	20090286507		2009-11-19	O'Neil, Douglas R. et al.	
	27	20100017506		2010-01-21	Fadell, Anthony	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

	28	20100191576		2010-07-29	Raleigh, Gregory G.	
	29	20100191612		2010-07-29	Raleigh, Gregory G.	
	30	20100192212		2010-07-29	Raleigh, Gregory G.	
	31	20100195503		2010-08-05	Raleigh, Gregory G.	
	32	20110126141		2011-05-26	King, Bennett M. et al.	
	33	20100325420		2010-12-23	Kanekar, Tushar	
	34	20100103820		2010-04-29	Fuller, Randy et al.	
	35	20070254675		2007-11-01	Zorlu Ozer, Sebnem et al.	
	36	20080005285		2008-01-03	Robinson, James David et al.	
	37	20080256593		2008-10-16	Vinberg, Anders B. et al.	
	38	20090077622		2009-03-19	Baum, Marc et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

	39	20090113514		2009-04-30	Hu, Q. James	
	40	20090288140		2009-11-19	Huber, Kurt Donald et al.	
	41	20100042675		2010-02-18	FUJII, Hiroshi	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2010088413	WO		2010-08-05	Headwater Partners I LLC		☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP030

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

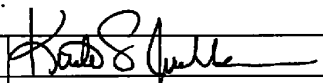
☐ See attached certification statement.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	2012-08-13
Name/Print	Krista S. Jacobsen	Registration Number	59,374

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal	
Application Number:	12695980
Filing Date:	28-Jan-2010
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	Krista Susan Jacobsen/Ann Taylor
Attorney Docket Number:	RALEP030 [26WV-160507]
Filed as Small Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	13487915
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	107265
Filer:	Krista Susan Jacobsen/Ann Taylor
Filer Authorized By:	Krista Susan Jacobsen
Attorney Docket Number:	RALEP030 [26WV-160507]
Receipt Date:	13-AUG-2012
Filing Date:	28-JAN-2010
Time Stamp:	23:44:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	8249
Deposit Account	505876
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	Trans.pdf	359886 f3a9722622ad313967968503150d39a7d7d3a594	no	1
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	IDS.pdf	1450717 ea250581922cb6f008383192b73aab46149b49a3	no	12
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	WO2010.pdf	8109078 055807212236103389 26e7c7d074f9ec8d64dd4a	no	97
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30657 a7cf0f01f7285886a160677dcad5cd3c9c89e886	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	9950338		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: TRAN.LET

Document Description: Transmittal Letter

PTO/SB/21 (07-09)
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	12/695,980
Filing Date	2010-01-28
First Named Inventor	Gregory G. Raleigh
Art Unit	3687 Conf.: 8973
Examiner Name	Rudy, Andrew J
Attorney Docket Number	RALEP030

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☑ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please identify below):

Remarks

You are hereby authorized to charge any additional fee required or credit any overpayment to Deposit Account No. 50-5876.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Headwater Partners I LLC		
Signature			
Printed name	Krista S. Jacobsen		
Date	August 13, 2012	Reg. No.	59,374

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature			
Typed or printed name	Ann Taylor	Date	August 13, 2012

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/695,980	01/28/2010	Gregory G. Raleigh	26WV-160507 [RALEP030]

CONFIRMATION NO. 8973

107265
Headwater Partners I LLC - Outside Firm 1
350 Marine Parkway, Suite 300
Redwood Shores, CA 94065

POA ACCEPTANCE LETTER

OC000000055642765

Date Mailed: 07/31/2012

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/16/2012.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/agizaw/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/695,980	01/28/2010	Gregory G. Raleigh	26WV-160507 [RALEP030]

CONFIRMATION NO. 8973

69849
SHEPPARD, MULLIN, RICHTER & HAMPTON LLP
379 Lytton Avenue
Palo Alto, CA 94301

POWER OF ATTORNEY NOTICE

OC000000055642725

Date Mailed: 07/31/2012

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/16/2012.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/agizaw/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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JUL 16 2012

PTO/SB/80 (11-08)
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 107265

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 107265

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Headwater Partners I LLC
350 Marine Parkway, Suite 300
Redwood City, CA 94065 U.S.A.

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	July 5, 2012
Name	Gregory G. Raleigh	Telephone	650-517-2781
Title	Manager		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Gregory G. Raleigh

Application No./Patent No.: 12/695,980 Filed/Issue Date: January 28, 2010

Entitled: Enhanced Roaming Services and Converged Carrier Networks With Device Assisted Services and a Proxy

Headwater Partners I LLC (Name of Assignee), a limited liability company (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☑ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest (The extent (by percentage) of its ownership interest is _____ %)

in the patent application/patent identified above by virtue of either:

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 024248, Frame 0308, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.
2. From: _____ To: _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.
3. From: _____ To: _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

☑ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Krista S. Jacobsen/ — Signature — July 16, 2012 — Date

Krista S. Jacobsen, Reg. No. 59,374 — Printed or Typed Name — 650-517-2798 — Telephone Number

Attorney of Record — Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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Date:	July 16, 2012
Send To:	Commissioner for Patents
Fax No.:	571-273-8300
From:	Krista S. Jacobsen, Head Counsel, Headwater Partners I LLC
Phone Number:	650-517-2798

Total Pages Including Cover: 3

Fax

Sir:

Following this cover sheet, please find form SB/80, granting power of attorney to prosecute applications before the USPTO to practitioners associated with the Customer Number 107265, and form SB/96, a statement under 37 C.F.R. § 3.73(b) establishing the right of assignee Headwater Partners I LLC to take action in application number 12/695,980.

Please let me know if you need any additional information to complete the Customer Number change in the application.

Sincerely,

Krista S. Jacobsen
Head Counsel, Headwater Partners I LLC
Reg. No. 59,374

PAGE 1/3 * RCVD AT 7/16/2012 3:43:31 PM [Eastern Daylight Time] * SVR:W-PTOFAX-003/2 * DNIS:2738300 * CSID:16506108051 * DURATION (mm-ss):00-44

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,980	01/28/2010	Gregory G. Raleigh	26WV-160507 [RALEP030]	8973

69849 7590 03/01/2012

SHEPPARD, MULLIN, RICHTER & HAMPTON LLP
379 Lytton Avenue
Palo Alto, CA 94301

EXAMINER	
RUDY, ANDREW J	
ART UNIT	**PAPER NUMBER**
3687	

MAIL DATE	DELIVERY MODE
03/01/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/695,980	RALEIGH, GREGORY G.	
	Examiner	Art Unit	
	ANDREW J. RUDY	3687	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) 1-20 is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-20 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koutsopoulou et al. (Middleware Platform for the Support of Charging Reconfiguration Actions, 2005) (page 1 of , reference 3D from Applicant's Information Disclosure Statement (IDS) submitted 8/27/2010) in view of Alonistioti et al. (Intelligent Architectures Enabling Flexible Service Provision and Adaptability, 2002) (page 1 of 2, reference 2Q from Applicant's IDS submitted 8/27/2010).

Koutsopoulou discloses, e.g. Fig. 1, pgs 2, 5, a processor in communication with a wireless network, e.g. a mobile phone having a processor connected to 3G network,

for charging information, e.g. Charging Gateway Function (CGF) and Charging Collection Function (CCF), network resources, e.g. CGF, AAA.

Koutsopoulou does not disclose augmenting or replacing network generated service usage information for the one or more devices.

Alonistioti teaches augmenting or replacing network generated service usage information for the one or more devices, e.g. pg. 2, a single bill should be generated per user for basic and value added services; and execute applications matching his/her needs as well as the current characteristics of the service provision context.

To have provided the teaching of augmenting or replacing network generated service usage information for the one or more devices for Koutsopoulou would have been obvious to one of ordinary skill in the art in view of Alonistioti. The motivation for having done such would have been to incorporate common knowledge technology for data records applications.

4. Further pertinent references of interest are noted on the attached PTO-892.

5. Applicant's Information Disclosure Statements (IDS's) have been reviewed. Note the attached IDS's.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREW J. RUDY whose telephone number is (571)272-6789. The examiner can normally be reached on Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Gart can be reached on 571-272-3955. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ANDREW J RUDY/

Primary Examiner, Art Unit 3687

Notice of References Cited	Application/Control No. 12/695,980	Applicant(s)/Patent Under Reexamination RALEIGH, GREGORY G.	
	Examiner ANDREW J. RUDY	Art Unit 3687	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,957,511	06-2011	Drudis et al.	379/201.01
*	B	US-7,797,204	09-2010	Balent, Bruce F.	705/28
*	C	US-7,174,174	02-2007	Boris et al.	455/461
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
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	P					
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*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	12695980
Filing Date	2010-01-28
First Named Inventor	RALEIGH, Gregory G.
Art Unit	2473
Examiner Name	YAO, Kwang Bin
Attorney Docket Number	26WV-160507 [RALEP030]

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2473
	Examiner Name	YAO, Kwang Bin
	Attorney Docket Number	26WV-160507 [RALEP030]

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	1	WO1999/065185	WO		1999-12-16	British Telecommunications Public Limited Company		☐

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EXAMINER SIGNATURE			
Examiner Signature	/Andrew Joseph Rudy/	Date Considered	02/10/2012

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Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	1	Atty Docket No.	RALEP030

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Examiner Initials	CiteNo.	Document Number Number-Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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	3M	WO 1999/065185	12-16-1999	British Telecommunications	

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Examiner	/Andrew Joseph Rudy/	Date Considered	02/10/2012

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PTO/SB/08 (08-03)

Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 28, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	1	Atty Docket No.	RALEP030

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Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T^2
	AA.		
	BB.		

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Search Notes	Application/Control No.	Applicant(s)/Patent under Reexamination	
	12/695,980	RALEIGH, GREGORY G.	
	Examiner	Art Unit	
	ANDREW J. RUDY	3687	

SEARCHED			
Class	Subclass	Date	Examiner
705	30	2/25/2012	AJR

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
Continuity data reviewed.	2/25/2012	AJR
Inventor name search conducted.	2/25/2012	AJR
Bibliographic data updated.	2/27/2012	AJR

PTO/SB/08 (08-03)

Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	2	Atty Docket No.	RALEP030

U.S. Patent Documents					
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FOREIGN PATENT DOCUMENTS					
Examiner Initials	Cite No.	Foreign Patent Document Country Code–Number–Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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	2E	WO 2003/058880	04-17-2003	Telia AB	

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Substitute for form 1449/PTO				*Complete if Known*	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	2	of	2	Atty Docket No.	RALEP030

Examiner	/Andrew Joseph Rudy/	Date Considered	02/10/2012

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CONFIRMATION NO. 8973

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
12/695,980	01/28/2010 RULE	705	3687	26WV-160507 [RALEP030]

APPLICANTS

Gregory G. Raleigh, Woodside, CA;

**** CONTINUING DATA ***************************

This application is a CIP of 12/380,780 03/02/2009
and is a CIP of 12/695,019 01/27/2010
and is a CIP of 12/695,021 01/27/2010
and claims benefit of 61/206,354 01/28/2009
and claims benefit of 61/206,944 02/04/2009
and claims benefit of 61/207,393 02/10/2009
and claims benefit of 61/207,739 02/13/2009
and claims benefit of 61/270,353 07/06/2009

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

02/16/2010

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /ANDREW JOSEPH RUDY/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		CA	23	20	1

ADDRESS

SHEPPARD, MULLIN, RICHTER & HAMPTON LLP
379 Lytton Avenue
Palo Alto, CA 94301
UNITED STATES

TITLE

ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 4

Complete if Known	
Application Number	12/695,980
Filing Date	January 28, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160507 [RALEP030]

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Examiner Signature	/Andrew Joseph Rudy/	Date Considered	02/10/2012

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application Number	12/695,980
Filing Date	January 28, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160507 [RALEP030]

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Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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Examiner Signature	/Andrew Joseph Rudy/	Date Considered	02/10/2012

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 3 of 4

Complete if Known	
Application Number	12/695,980
Filing Date	January 28, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160507 [RALEP030]

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 4 of 4

Complete if Known	
Application Number	12/695,980
Filing Date	January 28, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160507 [RALEP030]

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		International Search Report and Written Opinion mailed March 31, 2010 from International Serial Number PCT/US2010/022438 filed January 28, 2010.	

Examiner Signature	/Andrew Joseph Rudy/	Date Considered	02/10/2012

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Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	4	Atty Docket No.	RALEP030

U.S. Patent Documents					
Examiner Initials	CiteNo.	Document Number Number-Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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	B.	US 6,965,667	11-15-2005	TRABANDT et al.	
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Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	2	of	4	Atty Docket No.	RALEP030

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PTO/SB/08 (08-03)

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				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	3	of	4	Atty Docket No.	RALEP030

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				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
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	UUUUU.	US 2008/0229385	09-18-2008	FEDER et al.	
	VVVVV.	US 2008/0098062	04-24-2008	Balia	

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	1E	WO 2006/073837	07-13-2006	Symbol Technologies, Inc.	
	1F	WO 2004/028070	04-01-2004	Credant Technologies, Inc.	
	1G	WO 2004/095753	11-04-2004	Motorola Inc.	
	1H	WO 2003/014891	02-20-2003	The Boeing Company	
	1I	WO 2007/107701	09-27-2007	British Telecommunications	
	1J	EP 1463238	09-29-2004	Alcatel	
	1K	WO 2008/080430	07-10-2008	Telecom Italia S.P.A	
	1L	WO 2008/017837	02-14-2008	Symbian Software	
	1M	WO 2008/099802	08-21-2008	NEC Corporation	
	1N	WO 2007/001833	01-04-2007	Symbol Technologies	
	1O	EP 1739518	06-29-2005	Research In Motion	
	1P	WO 2007/069245	06-21-2007	Yoggie Security	
	1Q	WO 2008/066419	06-05-2008	Telefonaktiebolaget LM Ericsson	
	1R	WO 2006/050758	05-18-2006	Telefonaktiebolaget LM Ericsson	

Examiner	/Andrew Joseph Rudy/	Date Considered	02/10/2012

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T^2 = Applicant is to place a check mark here if English language Translation is attached

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.R./

PTO/SB/08a (07-09)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 4

Complete if Known	
Application Number	12/695,980
Filing Date	January 28, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160507 [RALEP030]

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		6,449,479	09-10-2002	SANCHEZ, Eduardo	
		6,603,969	08-05-2003	VUORISTO, et al.	
		6,658,254	12-02-2003	PURDY, et al.	
		6,785,889	08-31-2004	WILLIAMS	
		6,829,696	12-07-2004	BALMER et al	
		6,920,455	07-19-2005	WESCHLER, Paul	
		6,998,985	02-14-2006	REISMAN et al	
		7,027,408	04-11-2006	NABKEL, et al.	
		7,092,696	08-15-2006	HOSAIN et al	
		7,158,792	01-02-2007	COOK et al	
		7,180,855	02-20-2007	LIN	
		7,280,818	10-09-2007	CLAYTON, Steve	
		7,324,447	01-29-2008	MORFORD	
		7,421,004	09/02/2008	FEHER, Kamilo	
		7,450,591	11-11-2008	KORLING, et al.	
		7,486,185	02-03-2009	CULPEPPER et al	
		7,574,731	08-11-2009	FASCENDA, Anthony C.	
		7,580,857	08-25-2009	VanFLEET, et al.	
		7,617,516	11-10-2009	HUSLAK, et al.	
		7,620,065	11-17-2009	FALARDEAU, Eric	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] "Number[4] "Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3]Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6]Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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www.FormsWorkFlow.com

PTO/SB/08a (07-09)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application Number	12/695,980
Filing Date	January 28, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160507 [RALEP030]

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		7,668,903	02-23-2010	EDWARDS, et al.	
		7,720,505	05-18-2010	GOPI, et al.	
		7,848,768	12-07-2010	OMORI, et al.	
		7,868,778	01-11-2011	KENWRIGHT, David Norris	
		7,873,705	01-18-2011	KALISH, Dan	
		7,882,029	02/01/2011	WHITE, Craig R.	
		7,941,184	05-10-2011	PRENDERGAST et al	
		7,975,184	07-05-2011	GOFF et al	
		7,986,935	07-26-2011	D'SOUZA et al	
		8,005,459	08-23-2011	BALSILLIE, Jim	
		8,010,080	08-30-2011	THENTHIRUPERAI, et al.	
		8,010,081	08-30-2011	ROSKOWSKI, Steve	
		8,015,133	09-06-2011	WU, et al	
		8,015,234	09-06-2011	LUM et al	
		2002/0120540	08-29-2002	KENDE et al	
		2002/0131404	09-19-2002	MEHTA et al	
		2004/0132427	07-08-2004	LEE et al	
		2005/0254435	11-17-2005	MOAKLEY et al	
		2006/0014519	01-19-2006	MARSH et al	
		2006/0199608	09-07-2006	DUNN et al	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] "Number[4] "Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 3 of 4

Complete if Known	
Application Number	12/695,980
Filing Date	January 28, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160507 [RALEP030]

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		2007/0093243	04-26-2007	KAPADEKAR et al	
		2007/0259673	11-08-2007	WILLARS et al	
		2007/0263558	11-15-2007	SALOMONE	
		2008/0049630	02-28-2008	KOZISEK et al	
		2008/0147454	06-19-2008	WALKER, et al.	
		2008/0162637	07-03-2008	ADAMCZYK et al	
		2008/0167027	07-10-2008	GAUTIER et al	
		2008/0318547	12-25-2008	BALLOU et al	
		2009/0180391	07-16-2009	PETERSEN et al	
		2009/0197585	08-06-2009	AARON, Jeffrey A.	
		2009/0257379	10-15-2009	ROBINSON et al	
		2010/0082431	04-01-2010	RAMER et al	
		2010/0188975	07-29-2010	RALEIGH, Gregory G.	
		2010/0188990	07-29-2010	RALEIGH, Gregory G.	
		2010/0188992	07-29-2010	RALEIGH, Gregory G.	
		2010/0188994	07-29-2010	RALEIGH, Gregory G.	
		2010/0191846	07-29-2010	RALEIGH, Gregory G.	
		2010/0192170	07-29-2010	RALEIGH, Gregory G.	
		2010/0197268	08-05-2010	RALEIGH, Gregory G., et al	
		2010/0198698	08-05-2010	RALEIGH, Gregory G., et al	
		2010/0198939	08-05-2010	RALEIGH, Gregory G., et al	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] "Number[4] "Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

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Substitute for form 1449B/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 4 of 4

Complete if Known	
Application Number	12/695,980
Filing Date	January 28, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160507 [RALEP030]

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		International Search Report and Written Opinion mailed March 31, 2010 from International Serial Number PCT/US2010/022438 filed January 28, 2010.	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.
[1] Applicant's unique citation designation number (optional). [2] Applicant is to place a check mark here if English language Translation is attached.
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If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: MICHAEL SCHALLOP
VAN PELT, YI & JAMES LLP
SUITE 200
10050 N. FOOTHILL BLVD.
CUPERTINO, CA 95014

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference RALEP030PCT	Date of mailing *(day/month/year)* 31 MAR 2010 **FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US2010/022438	International filing date *(day/month/year)* 28 January 2010
Applicant HEADWATER PARTNERS I LLC	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver Telephone No. 571-272-7774

Form PCT/ISA/220 (January 2004) *(See notes on accompanying sheet)*

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference RALEP030PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2010/022438	International filing date *(day/month/year)* 28 January 2010	(Earliest) Priority Date *(day/month/year)* 28 January 2009
Applicant HEADWATER PARTNERS I LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/022438

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04L 29/08 (2010.01)
USPC - 709/223
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - H04L 29/08 (2010.01)
USPC - 709/223

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/0138601 A1 (PIPONIUS et al) 26 September 2002 (26.09.2002) entire document	1-20
A	US 2002/0176377 A1 (HAMILTON) 28 November 2002 (28.11.2002) entire document	1-20
A	US 2006/0034256 A1 (ADDAGATLA et al) 16 February 2006 (16.02.2006) entire document	1-20
A	US 2005/0228985 A1 (YLIKOSKI et al) 13 October 2005 (13.10.2005) entire document	1-20
A	US 2007/0036312 A1 (CAI et al) 15 February 2007 (15.02.2007) entire document	1-20

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 March 2010	31 MAR 2010
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: MICHAEL SCHALLOP
VAN PELT, YI & JAMES LLP
SUITE 200
10050 N. FOOTHILL BLVD.
CUPERTINO, CA 95014

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	31 MAR 2010
Applicant's or agent's file reference RALEP030PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2010/022438	28 January 2010	28 January 2009

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04L 29/08 (2010.01)
USPC - 709/223

Applicant HEADWATER PARTNERS I LLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial appticability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	10 March 2010	Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2009)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No. PCT/US2010/022438

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Form PCT/ISA/237 (Box No. I) (July 2009)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2010/022438

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	None	YES
	Claims	1-20	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-20 lack novelty under PCT Article 33(2) as being anticipated by Piponius et al., hereinafter referred to as Piponius.

Regarding claim 1, Piponius discloses a system, comprising a processor of a proxy network device (control logic CL of a user terminal device MS of a content billing proxy CBP (Fig. 3), paras. 0042 and 0043) in communication with a wireless network (in communication with cellular radio access network, para. 0042), wherein the processor is configured to collect device generated service usage information for one or more devices in wireless communication on the wireless network (control logic CL configured to generate information related to the charging detail records CDR related to the content service (Fig. 3), para. 0046); and provide the device generated service usage information in a syntax (control logic CL configured to generate information related to the charging detail records CDR related to the content service (Fig. 3), para. 0046) and a communication protocol that can be used by other network devices to augment or replace network generated service usage information for the one or more devices in wireless communication on the wireless network (proxy can perform the necessary protocol conversions from the protocol used by the content server to a protocol supported by the access network, para. 0034, 0038); and a memory coupled to the processor and configured to provide the processor with instructions (the proxy detects on the basis of its database that the requested service is a chargeable service and billing criteria is maintained in database wherein the database returns any possible special information related to billing, paras. 0046, 0048, and 0053).

Regarding claim 2, Piponius discloses the proxy network device includes a proxy server (content server CS (Fig. 3), para. 0046).

Regarding claim 3, Piponius discloses the proxy network device includes a proxy router (router R (Fig. 3), para. 0045).

Regarding claim 4, Piponius discloses the proxy network device provides a common network service between two or more networks (control logic, content billing gateway and database can be common to several routers and web switches, para. 0045).

Regarding claim 5, Piponius discloses the proxy network device is programmed using a centralized service design interface (one proxy can serve several content servers, it is a big advantage that by means of the proxy, different billing logics can be implemented in a centrallzed manner, whereln proxy can be updated, paras. 0033 and 0048).

Regarding claim 6, Piponius discloses the service usage information includes network service usage information (the traffic between the access network AN and one or more service networks SN is controlled by a content billing proxy CBP, para. 0043).

Regarding claim 7, Piponius discloses the syntax is a charging data record (CDR) (control logic CL configured to generate information related to the charging detail records CDR related to the content service (Fig. 3), para. 0046).

Regarding claim 8, Piponius discloses the service usage information includes network service usage information (the traffic between the access network AN and one or more service networks SN is controlled by a content billing proxy CBP, para. 0043).

Regarding claim 9, Piponius discloses the proxy network device includes a service usage data store (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057).

Regarding claim 10, Piponius discloses the proxy network device includes a service usage data store and a rules engine for aggregating the collected device generated service usage information (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2010/022438

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Regarding claim 11, Piponius discloses the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to aggregate device assisted CDRs for the one or more devices In wireless communication on the wireless network (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057); and apply a set of rules to the aggregated CDRs using a rules engine (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057).

Regarding claim 12, Piponius discloses the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to aggregate device assisted CDRs for the one or more devices In wireless communication on the wireless network (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057); apply a set of rules to the aggregated device assisted CDRs using a rules engine (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057); and communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system (the proxy updates the billing information related to the mobile station MS, para. 0048).

Regarding claim 13, Piponius discloses the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to aggregate device assisted CDRs for the one or more devices in wireless communication on the wireless network (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057); verify the aggregated device assisted CDRs (a content service corresponding to a service request from the content server CS to the subscriber terminal MS under the control of the proxy, para. 0046); and communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system (the proxy updates the billing information related to the mobile station MS, para. 0048).

Regarding claim 14, Piponius discloses the syntax is a charging data record (CDR), and the proxy network device Includes a CDR feed aggregator, and wherein the processor is further configured to aggregate device assisted CDRs for the one or more devices in wireless communication on the wireless network (the control logic generates the Information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057); verify the aggregated device assisted CDRs by comparing at least a subset of the aggregated device assisted CDRs to a set of network generated CDRs for the one or more devices in wireless communication on the wireless network (a content service corresponding to a service request from the content server CS to the subscriber terminal MS under the control of the proxy, para. 0046); and communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system based on the verifying of the aggregated device assisted CDRs (the proxy updates the billing information related to the mobile station MS, para. 0048).

Regarding claim 15, Piponius discloses the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to aggregate device assisted CDRs for the one or more devices in wireless communication on the wireless network (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057); apply a set of rules to the aggregated CDRs using a rules engine, wherein at least one rule includes a bill by account rule (billing criteria are most preferably maintained In a database DB of the proxy, para. 0046); and communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system (the proxy updates the billing information related to the mobile station MS, para. 0048).

Regarding claim 16, Piponius discloses the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to aggregate device assisted CDRs for the one or more devices in wireless communication on the wireless network (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057); apply a set of rules to the aggregated device assisted CDRs using a rules engine, wherein at least one rule includes a bill by account rule (billing criteria are most preferably maintained in a database DB of the proxy, para. 0046); and communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system (the proxy updates the billing information related to the mobile station MS, para. 0048), wherein at least one CDR includes a billing offset (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057).

Regarding claim 17, Piponius discloses the syntax is a charging data record (CDR), and the network device Includes a CDR feed aggregator network (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057), and whereln the processor is further configured to communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system (the proxy updates the billing information related to the mobile station MS, para. 0048).

Regarding claim 18, Piponius discloses the processor is further configured to communicate with a service controller to collect the device generated service usage information for the one or more devices in wireless communication on the wireless network (second logic 32 is to provide a content service corresponding to a service request from the content server CS to the subscriber terminal MS, para. 0046).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2010/022438

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Regarding claim 19, Piponius discloses the processor is further configured to communicate with a service controller, wherein the service controller is in communication with a billing interface or a billing system (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057), and wherein the service controller communicates the device generated service usage information to the network device (second logic 32 is to provide a content service corresponding to a service request from the content server CS to the subscriber terminal MS, para. 0046).

Regarding claim 20, Piponius discloses the processor is further configured to communicate the device generated service usage information to a billing interface or a billing system (the control logic generates the information needed by a charging record CDR and transmits them to the billing gateway BG, para. 0057).

Claims 1-20 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

Form PCT/ISA/237 (Supplemental Box) (July 2009)

Electronic Acknowledgement Receipt

EFS ID:	12011919
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	69849
Filer:	Marc A. Sockol/Linda Brost
Filer Authorized By:	Marc A. Sockol
Attorney Docket Number:	26WV-160507 [RALEP030]
Receipt Date:	06-FEB-2012
Filing Date:	28-JAN-2010
Time Stamp:	21:06:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		160507-RALEP030-IDS-020612.pdf	480056 4976f55cda92d40f029e386a207b0d7aa8065f3d	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	1
	Miscellaneous Incoming Letter	2	3
	Information Disclosure Statement (IDS) Form (SB08)	4	7
	Non Patent Literature	8	15
Warnings:			
Information:			
	Total Files Size (in bytes):	480056	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/21 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	12/695,980
Filing Date	January 28, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687 Conf. No. 8973
Examiner Name	Andrew J. Rudy
Total Number of Pages in This Submission: 15	Attorney Docket Number: 26WV-160507 [RALEP030]

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☒ Information Disclosure Statement with PTO/SB/08a/b (6 pgs.)
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
- ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation, Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s)
- ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) (please Identify below):
  Copy of International Search Report and Written Opinion for PCT/US2010/022438 (8 pgs.)

Remarks

You are hereby authorized to charge any additional fee required or credit any overpayment to Deposit Account No. 50-4561.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Sheppard, Mullin, Richter & Hampton LLP Customer No. 69849		
Signature			
Printed name	Marc A. Sockol		
Date	February 6, 2012	Reg. No.	40,823

CERTIFICATE OF ELECTRONIC TRANSMISSION

I hereby certify that this correspondence is being filed electronically via EFS-Web addressed to the Commissioner for Patents on the date shown below:

Signature	Linda K. Brost		
Typed or printed name	Linda K. Brost	Date	February 6, 2012

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner:
Gregory G. Raleigh	Andrew J. Rudy
Serial No.: 12/695,980	Art Unit: 3687
Filed: January 28, 2010	Conf. No.: 8973

Title: Enhanced Roaming Services and Converged Carrier Networks With Device Assisted Services and a Proxy

---

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT PURSUANT TO 37 C.F.R. §§1.97(b)

Sir:

In accordance with the duty of disclosure under 37 CFR §1.56 and pursuant to 37 CFR §§1.97-1.98, Applicant hereby notifies the U.S. Patent and Trademark Office of the references listed on the enclosed Form PTO-SB/08A. Pursuant to the USPTO's waiver of the requirements under 37 CFR 1.98(a)(2)(i) for submitting a copy of each cited U.S. patent, we are not submitting copies of U.S. patents and/or patent publications cited.

The present Information Disclosure Statement is being filed more than three months after the filing date but before receiving the first Office Action. Accordingly, no fee or certification is needed.

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicant reserves the right to dispute any of the listed documents as prior art during examination. Furthermore, Applicant does not waive any right to take any action that would be appropriate to antedate or

otherwise remove any listed document as a competent reference against the claims of the present application. The submission of this Information Disclosure Statement is not to be construed as a representation that a search has been made or that no other material information may exist.

The Examiner is requested to initial the enclosed Form PTO/SB/08A and return a copy thereof to the undersigned.

No fee is believed to be due relative to this submission, but if for any reason an insufficient fee has been paid, please charge the insufficiency to Deposit Account No. **50-4561**.

Respectfully submitted,

Date: February 6, 2012

By: _____

Marc A. Sockol, Reg. No. 40,823
Attorney for Applicants
Customer Number 69849
Sheppard, Mullin, Richter & Hampton LLP
379 Lytton Avenue
Palo Alto, CA 94301-1432
Telephone: (650) 815-2600

CERTIFICATE OF ELECTRONIC TRANSMISSION

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being filed electronically via EFS-Web addressed to the Commissioner for Patents on:

Date: February 6, 2012 By: Linda K. Brost

Linda K. Brost

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2473
	Examiner Name	YAO, Kwang Bin
	Attorney Docket Number	26WV-160507 [RALEP030]

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6651101		2003-11-18	GAI et al	
	2	7290283		2007-10-30	COPELAND III, John A.	
	3	7401338		2008-07-15	BOWEN et al	
	4	7197321		2007-03-27	ERSKINE et al	
	5	7516219		2009-04-07	MOGHADDAM et al	
	6	7647047		2010-01-12	MOGHADDAM et al	
	7	7929960		2011-04-19	MARTIN et al	
	8	7937069		2011-05-03	RASSAM, Frederic	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2473
	Examiner Name	YAO, Kwang Bin
	Attorney Docket Number	26WV-160507 [RALEP030]

	9	6563806		2003-05-13	YANO et al	
	10	6532235		2003-03-11	BENSON et al	
	11	7280816		2007-10-09	FRATTI et al	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20090125619		2009-05-14	ANTANI, Snehal S.	
	2	20080212470		2008-09-04	CASTANEDA et al	
	3	20080183812		2008-07-31	PAUL et al	
	4	20060178918		2006-08-10	MIKURAK	
	5	20040103193		2004-05-27	PANDYA et al	
	6	20050183143		2005-08-18	ANDERHOLM et al	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2473
	Examiner Name	YAO, Kwang Bin
	Attorney Docket Number	26WV-160507 [RALEP030]

	7	20070294395		2007-12-20	STRUB et al	
	8	20090287921		2009-11-19	ZHU et al	
	9	20060085543		2006-04-01	HRASTAR et al	
	10	20080059474		2008-03-01	LIM, Keng	
	11	20080066149		2008-03-01	LIM, Keng	
	12	20080066150		2008-03-01	LIM, Keng	
	13	20080167033		2008-07-10	BECKERS, Michel	
	14	20070298764		2007-12-27	CLAYTON	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] j	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	WO1999/065185	WO		1999-12-16	British Telecommunications Public Limited Company		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2473
	Examiner Name	YAO, Kwang Bin
	Attorney Docket Number	26WV-160507 [RALEP030]

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Author Unknown, "Data Roaming Tariffs - Transparency Measures." EUROPA - Europe's Information Society Thematic Portal website, date unknown.	☐
If you wish to add additional non-patent literature document citation information please click the Add button			

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695980
	Filing Date	2010-01-28
	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2473
	Examiner Name	YAO, Kwang Bin
	Attorney Docket Number	26WV-160507 [RALEP030]

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

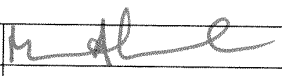
☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	2011-07-20
Name/Print	Marc A. Sockol	Registration Number	40,823

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	10564654
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	69849
Filer:	Marc A. Sockol/Linda Brost
Filer Authorized By:	Marc A. Sockol
Attorney Docket Number:	RALEP030
Receipt Date:	20-JUL-2011
Filing Date:	28-JAN-2010
Time Stamp:	19:38:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		160507-RALEP030-IDS072011.pdf	461411 3741f2890d385bc9d3c14e643bbb2e74d1a8c594	yes	14

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Information Disclosure Statement (IDS) Form (SB08)	1	6
	Non Patent Literature	7	14
Warnings:			
Information:			
	Total Files Size (in bytes):	461411	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	10564716
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	69849
Filer:	Marc A. Sockol/Linda Brost
Filer Authorized By:	Marc A. Sockol
Attorney Docket Number:	RALEP030
Receipt Date:	20-JUL-2011
Filing Date:	28-JAN-2010
Time Stamp:	19:51:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	WO1999-065185A2andA3.pdf	1952852 b4b22a6a3b435dba71663391f5ac019eb0e4ba7f	no	56

Warnings:	
Information:	

Total Files Size (in bytes):	1952852

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/695,980	01/28/2010	Gregory G. Raleigh	RALEP030

CONFIRMATION NO. 8973

21912
VAN PELT, YI & JAMES LLP
10050 N. FOOTHILL BLVD #200
CUPERTINO, CA 95014

POWER OF ATTORNEY NOTICE

OC000000047409031

Date Mailed: 05/02/2011

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/20/2011.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/hgray/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/695,980	01/28/2010	Gregory G. Raleigh	RALEP030

CONFIRMATION NO. 8973

69849
SHEPPARD, MULLIN, RICHTER & HAMPTON LLP
390 Lytton Avenue
Palo Alto, CA 94301

POA ACCEPTANCE LETTER

OC000000047409057

Date Mailed: 05/02/2011

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/20/2011.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/hgray/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☒ Practitioners associated with the Customer Number: 69849

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☒ The address associated with Customer Number: 69849

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:
Headwater Partners I, LLC
350 Marine Parkway, Suite 300
Redwood City, California 94065
U.S.A.

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record
The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date: 18 MARCH, 2011
Name	David R. Johnson	Telephone: 650-517-2782
Title	Chief Financial Officer	

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	9924349
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	21912
Filer:	Marc A. Sockol/Linda Brost
Filer Authorized By:	Marc A. Sockol
Attorney Docket Number:	RALEP030
Receipt Date:	20-APR-2011
Filing Date:	28-JAN-2010
Time Stamp:	20:57:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		160507POAand3-73bStmt042011.pdf	157191 c7bd0ecef715b44f6b543e5459c10e295ba254ea	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Assignee showing of ownership per 37 CFR 3.73(b).	1	2
	Power of Attorney	3	4
Warnings:			
Information:			
	Total Files Size (in bytes):	157191	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Gregory G. Raleigh

Application No./Patent No.: 12/695,980 Filed/Issue Date: January 28, 2010

Titled: Enhanced Roaming Services and Converged Carrier Networks With Device Assisted Services and a Proxy

Headwater Partners I, LLC , a limited liability company
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 024248, Frame 0308, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature — April 20, 2011 (Date)

Marc A. Sockol, Reg. No. 40,823 (Printed or Typed Name) — Attorney of Record (Title)

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Privacy Act Statement

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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/08 (08-03)

Substitute for form 1449/PTO				Complete if Known	
				Application No.:	12/695,980
Information Disclosure Statement By Applicant				Filing Date	January 28, 2010
(Use as many sheets as necessary)				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	1	Atty Docket No.	RALEP030

U.S. Patent Documents					
Examiner Initials	Cite No.	Document Number Number-Kind Code (If known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A.	US 2003/0088671	05-08-2003	KLINKER et al.	
	B.	US 2007/0248100	10-25-2007	ZUBERI et al.	
	C.	US 2008/0130534	06-05-2008	Tazuko Tomioka	
	D.	US 2006/0236095	10-19-2006	SMITH et al.	
	E.	US 2009/0054030	02-26-2009	Golds	
	F.	US 6,952,428	10-04-2005	NECKA et al.	
	G.	US 2010/0043068	02-18-2010	VARADHAN et al.	
	H.	US 2010/0071053	03-18-2010	ANSARI et al.	
	I.	US 2003/0005112	01-03-2003	Krautkremer	
	J.	US 2006/0045245	03-02-2006	AARON et al.	
	K.	US 2007/0076616	04-05-2007	NGO et al.	
	L.	US 2006/0190314	08-24-2006	Hernandez	
	M.	US 2009/0271514	10-29-2009	THOMAS et al.	
	N.	US 6,684,244	01-27-2004	GOLDMAN et al.	
	O.	US 2005/0055291	03-10-2005	BEVENTE et al.	
	P.	US 2006/0019632	01-26-2006	CUNNINGHAM et al.	
	Q.	US 2005/0238046	10-27-2005	HASSAN et al.	
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Examiner Initials	Cite No.	Foreign Patent Document Country Code–Number–Kind Code (If known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	Z.	WO 2007/018363	08-02-2006	Upresto, Inc.	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T^2
	AA.		
	BB.		

Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T^2 = Applicant is to place a check mark here if English language Translation is attached

Electronic Acknowledgement Receipt

EFS ID:	8592351
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	21912
Filer:	Michael J. Schallop/Veronica Pula
Filer Authorized By:	Michael J. Schallop
Attorney Docket Number:	RALEP030
Receipt Date:	08-OCT-2010
Filing Date:	28-JAN-2010
Time Stamp:	19:31:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	RALEP030_IDS_Before_1st_OA.pdf	57273 75176d135c163b2982cc63e2c714aad394b0ec16	no	2
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Information:					

2	Information Disclosure Statement (IDS) Filed (SB/08)	RALEP030_IDS_SB08_before_1st_OA_2_.pdf	101004 3d4eac1aba0877c6f1f13241e2c5c59eed4e00d0	no	1
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		Total Files Size (in bytes):	1480900		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Gregory G. Raleigh	Examiner:	Not Assigned
Application No.:	12/695,980	Art Unit:	2617
Filed:	January 27, 2010	Docket No.:	RALEP030
Title:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY		

INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §§1.56 AND 1.97(b) BEFORE MAILING OF A FIRST OFFICE ACTION

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The references listed in the attached PTO SB/08, may be material to examination of the above-identified patent application. Applicants disclose these references in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make these references of official record in this application. Copies of the cited references are provided to the extent required by 37 CFR §1.98 and any applicable waivers.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

This Information Disclosure Statement is being filed (1) with the above-referenced application or (2) within three months of the filing date of the above-referenced application or (3) before the mailing date of a first Office Action on the merits or (4) before the mailing date of a first Office Action after filing of a Request for Continued Examination. Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 50-0685 (Order No. RALEP030).

Respectfully submitted,
VAN PELT, YI & JAMES LLP

/Michael J. Schallop/

Michael J. Schallop
Registration No. 44,319
V (408) 207-4762
F (408) 973-2595

10050 N. Foothill Blvd, Ste 200
Cupertino, CA 95014

Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	4	Atty Docket No.	RALEP030

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Examiner Initials	CiteNo.	Document Number Number-Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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	B.	US 6,965,667	11-15-2005	TRABANDT et al.	
	C.	US 2008/0268813	10-13-2008	Stephane H. Maes	
	D.	US 2007/0255848	11-01-2007	SEWALL et al.	
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	G.	US 5,892,900	04-06-1999	GINTER et al.	
	H.	US 7,403,763	07-22-2008	Stephane H. Maes	
	I.	US 7,317,699	01-08-2008	GODFREY et al.	
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				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	2	of	4	Atty Docket No.	RALEP030

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	VV.	US 2007/0100981	05-03-2007	ADAMCZYK et al.	
	WW.	US 2007/0022289	01-25-2007	ALT et al.	
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Substitute for form 1449/PTO				Complete if Known	
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				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	3	of	4	Atty Docket No.	RALEP030

	EEEE.	US 2008/0305793	12-11-2008	GALLAGHER et al.	
	FFFF.	US 2008/0083013	04-03-2008	SOLIMAN et al.	
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	TTTTT.	US 2008/0162704	04-03-2008	POPLETT et al.	

Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	4	of	4	Atty Docket No.	RALEP030

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	VVVVV.	US 2008/0098062	04-24-2008	Balia	

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Examiner Initials	Cite No.	Foreign Patent Document Country Code–Number–Kind Code (known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1A	WO 2006/130960	12-14-2006	Mobidia, Inc.	
	1B	EP 1772988A1	04-11-2007	Huawei Technologies, Co., LTD.	
	1C	EP 1978772A1	10-08-2008	British Telecommunications	
	1D	WO 2007/053848	05-10-2007	Mobile Armor, LLC	
	1E	WO 2006/073837	07-13-2006	Symbol Technologies, Inc.	
	1F	WO 2004/028070	04-01-2004	Credant Technologies, Inc.	
	1G	WO 2004/095753	11-04-2004	Motorola Inc.	
	1H	WO 2003/014891	02-20-2003	The Boeing Company	
	1I	WO 2007/107701	09-27-2007	British Telecommunications	
	1J	EP 1463238	09-29-2004	Alcatel	
	1K	WO 2008/080430	07-10-2008	Telecom Italia S.P.A	
	1L	WO 2008/017837	02-14-2008	Symbian Software	
	1M	WO 2008/099802	08-21-2008	NEC Corporation	
	1N	WO 2007/001833	01-04-2007	Symbol Technologies	
	1O	EP 1739518	06-29-2005	Research In Motion	
	1P	WO 2007/069245	06-21-2007	Yoggie Security	
	1Q	WO 2008/066419	06-05-2008	Telefonaktiebolaget LM Ericsson	
	1R	WO 2006/050758	05-18-2006	Telefonaktiebolaget LM Ericsson	

Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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Electronic Acknowledgement Receipt

EFS ID:	8307313
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	21912
Filer:	Michael J. Schallop/Veronica Pula
Filer Authorized By:	Michael J. Schallop
Attorney Docket Number:	RALEP030
Receipt Date:	27-AUG-2010
Filing Date:	28-JAN-2010
Time Stamp:	18:48:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

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New International Application Filed with the USPTO as a Receiving Office
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Gregory G. Raleigh	Examiner:	Not Assigned
Application No.:	12/695,980	Art Unit:	2617
Filed:	January 27, 2010	Docket No.:	RALEP030
Title:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY		

INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §§1.56 AND 1.97(b) BEFORE MAILING OF A FIRST OFFICE ACTION

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The references listed in the attached PTO SB/08, may be material to examination of the above-identified patent application. Applicants disclose these references in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make these references of official record in this application. Copies of the cited references are provided to the extent required by 37 CFR §1.98 and any applicable waivers.

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Respectfully submitted,
VAN PELT, YI & JAMES LLP

/Michael J. Schallop/

Michael J. Schallop
Registration No. 44,319
V (408) 207-4762
F (408) 973-2595

10050 N. Foothill Blvd, Ste 200
Cupertino, CA 95014

Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	1	Atty Docket No.	RALEP030

U.S. Patent Documents					
Examiner Initials	CiteNo.	Document Number Number-Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	3AA	US 7,747,240	06-29-2010	BRISCOE et al.	
	3BB	US 2003/0088671	05-08-2003	KINKER et al.	
	3CC	US 2007/0248100	10-25-2007	ZUBERI et al.	
	3DD	US 2008/0130534	06-05-2008	Tazuko Tomioka	

FOREIGN PATENT DOCUMENTS					
Examiner Initials	Cite No.	Foreign Patent Document Country Code–Number–Kind Code	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	3A	WO 2007/014630	02-08-2007	Telefonaktiebolaget LM Ericsson	
	3B	WO 2006/004467	01-12-2006	Telefonaktiebolaget LM Ericsson	
	3M	WO 1999/065185	12-16-1999	British Telecommunications	

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T^2
	3C	KNIGHT et al., Layer 2 and 3 Virtual Private Networks: Taxonomy, Technology, and Standardization Efforts, IEEE Communications Magazine, June 2004	
	3D	KOUTSOPOULOU et al., Middleware Platform for the Support of Charging Reconfiguration Actions, 2005	
	3E	NILSSON et al., A Novel MAC Scheme for Solving the QoS Parameter Adjustment Problem in IEEE802.11e EDCA, February 2006	
	3F	Author Unknown, Overview of GSM, GPRS, and UMTS, Chapter 2, November 4, 2008	
	3G	CHAOUCHI et al., Policy Based Networking in the Integration Effort Of 4G Networks and Services, 2004 IEEE	
	3H	ZHU et al., A Survey of Quality of Service in IEEE 802.11 Networks, IEEE Wireless Communications, August 2004	
	3I	KYRIAKAKOS et al., Ubiquitous Service Provision in Next Generation Mobile Networks, Proceedings of the 13th IST Mobile and Wireless Communications Summit, Lyon, France, June 2004	
	3J	FAROOQ et al., An IEEE 802.16 WiMax Module for the NS-3 Simulator, March 2-6, 2009	
	3K	Author Unknown, HP, IP Multimedia Services Charging, A White Paper from HP, January 2006	
	3L	Author Unknown, Kindle™ User's Guide 3rd Edition, Copyright 2004-2009	

Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T^2 = Applicant is to place a check mark here if English language Translation is attached

Electronic Acknowledgement Receipt

EFS ID:	8307973
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	21912
Filer:	Michael J. Schallop/Veronica Pula
Filer Authorized By:	Michael J. Schallop
Attorney Docket Number:	RALEP030
Receipt Date:	27-AUG-2010
Filing Date:	28-JAN-2010
Time Stamp:	18:51:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	RALEP030_IDS_Before_1st_OA.pdf	57273 75176d135c163b2982cc63e2c714aad394b0ec16	no	2
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Information:					

2	Information Disclosure Statement (IDS) Filed (SB/08)	RALEP030_IDS_SB08_3.pdf	87669 cb311c10c33d8ec5abbe6fb10a57808133384b7a	no	1
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Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	RALE_Foreign_Ref_3A.pdf	7292666 bda2da57ab175aa54d24e9cd7699784789063e0a	no	55
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4	Foreign Reference	RALE_Foreign_Ref_3B.pdf	4238695 2b1ac857c7db7ca12f5a92190a59fb4eac5e537a	no	29
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Information:					
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8	NPL Documents	RALE_NPL_Ref_3F.pdf	5141787 6ecd30cfa00263c87082d7274ae16e8caa198bf1	no	35
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9	NPL Documents	RALE_NPL_Ref_3G.pdf	1451509 e95282786ba86e4a05ee8c793a9ec634aa5a654c	no	6
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10	NPL Documents	RALE_NPL_Ref_3H.pdf	128010 8d35d15d27cc8636c1526980a75aa6a4a97a745d	no	9

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13	NPL Documents	RALE_NPL_Ref_3K.pdf	2587996 104930755650d3cb8fbbb63837dc7338fbc2bd3c	no	16
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14	NPL Documents	RALE_NPL_Ref_3L.pdf	1050612 c5435588dd68fcddc7835e4dce1e6489894a398b	no	124
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Information:					
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Gregory G. Raleigh	Examiner:	Not Assigned
Application No.:	12/695,980	Art Unit:	2617
Filed:	January 27, 2010	Docket No.:	RALEP030
Title:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY		

INFORMATION DISCLOSURE STATEMENT
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Respectfully submitted,
VAN PELT, YI & JAMES LLP

/Michael J. Schallop/

Michael J. Schallop
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V (408) 207-4762
F (408) 973-2595

10050 N. Foothill Blvd, Ste 200
Cupertino, CA 95014

Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	2	Atty Docket No.	RALEP030

U.S. Patent Documents					
Examiner Initials	CiteNo.	Document Number Number-Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS					
Examiner Initials	Cite No.	Foreign Patent Document Country Code–Number–Kind Code (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	2A	WO 2006/077481	07-27-2006	True Context Corporation	
	2B	WO 2008/051379	05-02-2008	Verizon Services	
	2C	WO 2008/080139	07-03-2008	Integrated Mobile	
	2D	WO 2004/077797	09-10-2004	Boston Communications	
	2E	WO 2003/058880	04-17-2003	Telia AB	

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T^2
	2F	HARTMANN et al., Agent-Based Banking Transactions & Information Retrieval-What about Performance Issues? 1999	
	2G	VAN EIJK, et al., GigaMobile, Agent Technology for Designing Personalized Mobile Service Brokerage, July 1, 2002	
	2H	YU LI, Dedicated E-Reading Devices: The State of the Art and Challenges, Scroll, Vol. 1, No. 1, 2008	
	2I	DIKAIAKOS et al., A Distributed Middleware Infrastructure for Personalized Services, November 24, 2003	
	2J	RAO et al., Evolution of Mobile Location-Based Services, Communication of the ACM, December 2003	
	2K	CHANDRASEKHAR et al., Femtocell Networks: A Survey, June 28, 2008	
	2L	HOSSAIN et al., Gain-Based Selection of Ambient Media Services in Pervasive Environments, 2008	
	2M	Author Unknown, 3GPP TS 23.203, V8.4.0, 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and Charging Control Architecture (Release 8), December 2008	
	2N	Author Unknown, 3GPP TS 23.401, V8.4.0, 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; General Packer Radio Service (GPRS) Enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Access (Release 8), December 2008	
	2O	STEPHAN STEGLICH, I-Centric User Interaction, November 21, 2003	
	2P	HAN et al., Information Collection Services for Qos-Aware Mobile Applications, 2005	
	2Q	ALONISTIOTI et al., Intelligent Architectures Enabling Flexible Service Provision and Adaptability, 2002	
	2R	ROLF OPPLIGER, Internet Security: Firewalls and Bey, Communications of the ACM, May 1997, Vol. 40. No.5	

PTO/SB/08 (08-03)

Substitute for form 1449/PTO				*Complete if Known*	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,980
				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	2	of	2	Atty Docket No.	RALEP030

Examiner	Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

T[2] = Applicant is to place a check mark here if English language Translation is attached

Electronic Acknowledgement Receipt

EFS ID:	8307722
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	21912
Filer:	Michael J. Schallop/Veronica Pula
Filer Authorized By:	Michael J. Schallop
Attorney Docket Number:	RALEP030
Receipt Date:	27-AUG-2010
Filing Date:	28-JAN-2010
Time Stamp:	18:50:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	RALEP030_IDS_Before_1st_OA.pdf	57273 75176d135c163b2982cc63e2c714aad394b0ec16	no	2

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2	Information Disclosure Statement (IDS) Filed (SB/08)	RALEP030_IDS_SB08_2.pdf	89829 2fa5f598470c630a2b9155fa8226d258157454f4	no	2
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3	Foreign Reference	RALE_Foreign_Ref_2A.pdf	5821505 81bd528285eeb7055e34118b1c6f3ad0b406f580	no	34
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13	NPL Documents	RALE_NPL_Ref_2K.pdf	384366 ca4acdc0719ea1636b3d667e2aafd3397dfca7ef	no	23
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Gregory G. Raleigh	Examiner:	Not Assigned
Application No.:	12/695,980	Art Unit:	2617
Filed:	January 27, 2010	Docket No.:	RALEP030
Title:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY		

INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §§1.56 AND 1.97(b) BEFORE MAILING OF A FIRST OFFICE ACTION

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Respectfully submitted,
VAN PELT, YI & JAMES LLP

/Michael J. Schallop/

Michael J. Schallop
Registration No. 44,319
V (408) 207-4762
F (408) 973-2595

10050 N. Foothill Blvd, Ste 200
Cupertino, CA 95014

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/695,980	01/28/2010	Gregory G. Raleigh	RALEP030

CONFIRMATION NO. 8973

21912
VAN PELT, YI & JAMES LLP
10050 N. FOOTHILL BLVD #200
CUPERTINO, CA 95014

PUBLICATION NOTICE

OC000000042916201

Title:ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY

Publication No.US-2010-0197268-A1
Publication Date:08/05/2010

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/695,980	01/28/2010	2617	1220	RALEP030	20	1

CONFIRMATION NO. 8973

UPDATED FILING RECEIPT

21912
VAN PELT, YI & JAMES LLP
10050 N. FOOTHILL BLVD #200
CUPERTINO, CA 95014

OC00000041269173

Date Mailed: 04/26/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Gregory G. Raleigh, Woodside, CA;

Assignment For Published Patent Application

HEADWATER PARTNERS I LLC, Woodside, CA

Power of Attorney: The patent practitioners associated with Customer Number 21912

Domestic Priority data as claimed by applicant

This application is a CIP of 12/380,780 03/02/2009
and is a CIP of 12/695,019 01/27/2010
and is a CIP of 12/695,021 01/27/2010
and claims benefit of 61/206,354 01/28/2009
and claims benefit of 61/206,944 02/04/2009
and claims benefit of 61/207,393 02/10/2009
and claims benefit of 61/207,739 02/13/2009
and claims benefit of 61/270,353 07/06/2009

Foreign Applications

If Required, Foreign Filing License Granted: 02/16/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/695,980**

Projected Publication Date: 08/05/2010

Non-Publication Request: No

Early Publication Request: No

Title

ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY

Preliminary Class

455

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where

the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Gregory G. Raleigh	Examiner:	Not Assigned
Application No.:	12/695,980	Art Unit:	2617
Filed:	January 28, 2010	Docket No.:	RALEP030
Title:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY		

RESPONSE TO NOTICE TO FILE MISSING PARTS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is a Response to Notice to File Missing Parts mailed **February 17, 2010.**

Application Elements:

☒ Declaration

☒ Newly executed (original or copy)

☐ Copy from a prior application (37 CFR 1.63(d) for a continuation or divisional). The entire disclosure of the prior application from which a copy of the declaration is herein supplied is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

☐ Deletion of inventors Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).

Accompanying Application Parts:

☐ Information Disclosure Statement with Form PTO/SB/08 ☐ Copies of IDS Citations

☐ Preliminary Amendment (*New claims numbered after highest original claim in prior application.*)

☐ Return Receipt Postcard

☐ Copy of Notice to File Missing Parts of NonProvisional Application

☐ Other:

Amendments

☐ Cancel in this application original claims _____ of the prior application before calculating the filing fee. (*At least one original independent claim must be retained.*)

Fee Calculation (37 CFR § 1.16)

					Small Entity			Large Entity	
					Rate	Fee		Rate	Fee
Filing Fees					x $165 = $		OR	x $330 = $	330
Search Fees					x $270 = $		OR	x $540 = $	540
Examination Fees					x $110 = $		OR	x $220 = $	220
CLAIMS	Filed.		Extra						
Total	20	Less 20	-0-		x $26 = $		OR	x $52 = $	
Independent	1	Less 3	-0-		x $110 = $		OR	x $220 = $	
Multiple Dependent Claims			-0-		x $195 = $		OR	x $390 = $	
Declaration and Surcharge Fee					X $65 = $		OR	X $130 = $	130
					TOTAL FILING FEE $			TOTAL FILING FEE $	**1220.00**

☐ Applicants petition for an extension of time to respond under 37 CFR § 1.136(a) as follows:

		SMALL ENTITY			LARGE ENTITY	
		Rate	Add'l Fee		Rate	Add'l Fee
☐ Extension for Response within FIRST month		x $65 = $		OR	x $130 = $	
☐ Extension for Response within SECOND month		x $245 = $		OR	x $490 = $	
☐ Extension for Response within THIRD month		x $555 = $		OR	x $1110 = $	
☐ Extension for Response within FOURTH month		x $865 = $		OR	x $1730= $	
☐ Extension for Response within FIFTH month		x $1175 = $		OR	x $2350 = $	

☐ Check No. _____for $_____ is enclosed.

General Authorizations

☒ Applicants hereby make and generally authorize any Petitions for Extensions of Time as needed for this or any subsequent filings. The Commissioner is also authorized to charge any extension fees under 37 CFR §1.17 as needed to Deposit Account No. 50-0685 (Order No. RALEP030).

☒ The Commissioner is given general authorization to charge any fees or to credit any overpayment during the pendency of this application to Deposit Account No. 50-0685 (Order No. RALEP030).

☒ Please send correspondence to the following address:

Customer No. 21912
VAN PELT, YI & JAMES LLP
10050 N. Foothill Blvd.
Suite 200
Cupertino, CA 95014

Date: April 15, 2010

/Michael J. Schallop/
Michael J. Schallop
Registration No. 44,319

DECLARATION AND POWER OF ATTORNEY FOR ORIGINAL U.S. PATENT APPLICATION

Attorney's Docket No. RALEP030

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY**, the specification of which,

(check one)

1. ☐ is attached hereto.

2. ☒ was filed on January 28, 2010 as U.S. Application No. 12/695,980 and was amended on _____.

3. ☐ was filed on _____ as International PCT Application No. _____ and was amended on _____.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

For Assigned Inventions: I understand that the purpose of making this appointment is to permit prosecution of patent applications for the above-identified invention for the benefit of my assignee, and that this appointment does not create an attorney-client relationship between me and these appointees.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under Title 35, United States code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s) Priority Benefits Claimed?

(Appl. No.)	(Country)	(Filing Date)	☐Yes ☐No

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

Prior Provisional Application(s)

(Application No.)	(Filing Date)
61/206,354	1/28/2009
61/206,944	2/4/2009

61/207,393 (Application No.)	2/10/2009 (Filing Date)
61/207,739 (Application No.)	2/13/2009 (Filing Date)
61/270,353 (Application No.)	7/6/2009 (Filing Date)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Prior U.S. Application(s)

12/380,780 (Application No.)	3/2/2009 (Filing Date)	PENDING (Status - patented, pending, abandoned)
12/695,019 (Application No.)	1/27/2010 (Filing Date)	PENDING (Status - patented, pending, abandoned)
12/695,021 (Application No.)	1/27/2010 (Filing Date)	PENDING (Status - patented, pending, abandoned)

And I hereby appoint the attorneys and/or agents associated with Customer No. **21912** as my principal attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Please Direct all Correspondence To: **Customer No. 21912**
VAN PELT, YI & JAMES LLP
10050 N. Foothill Blvd., Suite 200
Cupertino, CA 95014

Direct Telephone Calls To: **Michael J. Schallop at telephone number (408) 207-4762**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full name of sole or first inventor	Gregory G. Raleigh				
Signature of sole or first inventor				Date:	4/8, 2010
Residence: City	Woodside	State:	CA	Citizenship:	US
Mailing Address	2995 Woodside Road, Suite 400, Woodside, CA 94062				

Electronic Patent Application Fee Transmittal

Application Number:	12695980
Filing Date:	28-Jan-2010
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	Michael J. Schallop/Veronica Pula
Attorney Docket Number:	RALEP030

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	330	330
Utility Search Fee	1111	1	540	540
Utility Examination Fee	1311	1	220	220
Pages:				
Claims:				
Miscellaneous-Filing:				
Late filing fee for oath or declaration	1051	1	130	130
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1220**

Electronic Acknowledgement Receipt	
EFS ID:	7429886
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	21912
Filer:	Michael J. Schallop/Veronica Pula
Filer Authorized By:	Michael J. Schallop
Attorney Docket Number:	RALEP030
Receipt Date:	16-APR-2010
Filing Date:	28-JAN-2010
Time Stamp:	16:56:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1220
RAM confirmation Number	3420
Deposit Account	500685
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	RALEP030_Response_to_Missing_Parts.pdf	83812 8a60ff47af750b85233a214a64a2b371c14e078e	no	2
Warnings:					
Information:					
2	Oath or Declaration filed	RALEP030_Declaration_POA.pdf	490933 510f3ee4925bff2199f2b44665a37f127b6fb524	no	2
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	37104 73352cedac5a9f225bc748f361de8aec6dec2a5e	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	611849		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/695,980	01/28/2010	Gregory G. Raleigh	RALEP030

CONFIRMATION NO. 8973

21912
VAN PELT, YI & JAMES LLP
10050 N. FOOTHILL BLVD #200
CUPERTINO, CA 95014

FORMALITIES LETTER

OC000000040099998

Date Mailed: 02/17/2010

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
  *Applicant must submit $**330** to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).*
- The oath or declaration is missing.
  A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
  Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $**130** for a non-small entity, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is $**1220** for a non-small entity
- $**330** Statutory basic filing fee.
- $**130** Surcharge.
- The application search fee has not been paid. Applicant must submit $**540** to complete the search fee.
- The application examination fee has not been paid. Applicant must submit $**220** to complete the examination fee for a non-small entity.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/tnguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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CUPERTINO, CA 95014

FILING RECEIPT

OC000000040099997

Date Mailed: 02/17/2010

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Applicant(s)

Gregory G. Raleigh, Woodside, CA;

Assignment For Published Patent Application

HEADWATER PARTNERS I LLC, Woodside, CA

Power of Attorney: None

Domestic Priority data as claimed by applicant

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and is a CIP of 12/695,019 01/27/2010
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and claims benefit of 61/206,354 01/28/2009
and claims benefit of 61/206,944 02/04/2009
and claims benefit of 61/207,393 02/10/2009
and claims benefit of 61/207,739 02/13/2009
and claims benefit of 61/270,353 07/06/2009

Foreign Applications

If Required, Foreign Filing License Granted: 02/16/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/695,980**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Title

ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY

Preliminary Class

455

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For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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NOT GRANTED

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Attorney Docket No. RALEP030

APPLICATION FOR UNITED STATES PATENT

ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY

By Inventor(s):

Gregory G. Raleigh
Woodside, CA
A Citizen of the United States

Assignee: Headwater Partners I LLC, a Delaware limited liability company

VAN PELT, YI & JAMES LLP
10050 N. Foothill Blvd., Suite 200
Cupertino, CA 95014
Telephone (408) 973-2585

ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY

CROSS REFERENCE TO OTHER APPLICATIONS

[0001] This application claims priority to U.S. Provisional Patent Application No. 61/206,354 (Attorney Docket No. RALEP001+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed January 28, 2009, U.S. Provisional Patent Application No. 61/206,944 (Attorney Docket No. RALEP002+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed February 4, 2009, U.S. Provisional Application No. 61/207,393 (Attorney Docket No. RALEP003+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed February 10, 2009, U.S. Provisional Patent Application No. 61/207,739 (Attorney Docket No. RALEP004+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed on February 13, 2009, U.S. Provisional Patent Application No. 61/270,353 (Attorney Docket No. RALEP022+) entitled DEVICE ASSISTED CDR CREATION, AGGREGATION, MEDIATION AND BILLING filed on July 6, 2009, which are incorporated herein by reference for all purposes.

[0002] This application is a continuation in part of co-pending U.S. Patent Application No. 12/380,780 (Attorney Docket No. RALEP007), entitled AUTOMATED DEVICE PROVISIONING AND ACTIVATION, filed on March 2, 2009, which is incorporated herein by reference for all purposes, and which claims priority to U.S. Provisional Patent Application No. 61/206,354 (Attorney Docket No. RALEP001+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed January 28, 2009, U.S. Provisional Patent Application No. 61/206,944 (Attorney Docket No. RALEP002+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed February 4, 2009, U.S. Provisional Application No. 61/207,393 (Attorney Docket No. RALEP003+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed February 10, 2009, and U.S. Provisional Patent Application No. 61/207,739 (Attorney Docket No. RALEP004+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed on February 13, 2009, which are incorporated herein by reference for all purposes; U.S. Patent Application No. 12/695,019 (Attorney Docket No. RALEP022) entitled DEVICE ASSISTED CDR CREATION,

AGGREGATION, MEDIATION AND BILLING filed on January 27, 2010, which is incorporated herein by reference for all purposes, and U.S. Provisional Patent Application No. 61/206,354 (Attorney Docket No. RALEP001+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed January 28, 2009, U.S. Provisional Patent Application No. 61/206,944 (Attorney Docket No. RALEP002+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed February 4, 2009, U.S. Provisional Application No. 61/207,393 (Attorney Docket No. RALEP003+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed February 10, 2009, U.S. Provisional Patent Application No. 61/207,739 (Attorney Docket No. RALEP004+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed on February 13, 2009, U.S. Provisional Patent Application No. 61/270,353 (Attorney Docket No. RALEP022+) entitled DEVICE ASSISTED CDR CREATION, AGGREGATION, MEDIATION AND BILLING filed on July 6, 2009, and U.S. Provisional Patent Application No. 61/264,126 (Attorney Docket No. RALEP0028+) entitled DEVICE ASSISTED SERVICES ACTIVITY MAP filed on November 24, 2009, which are incorporated herein by reference for all purposes; and U.S. Patent Application No. 12/695,021 (Attorney Docket No. RALEP029) entitled QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES filed on January 27, 2010, which claims priority to U.S. Provisional Patent Application No. 61/206,354 (Attorney Docket No. RALEP001+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed January 28, 2009, U.S. Provisional Patent Application No. 61/206,944 (Attorney Docket No. RALEP002+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed February 4, 2009, U.S. Provisional Application No. 61/207,393 (Attorney Docket No. RALEP003+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed February 10, 2009, U.S. Provisional Patent Application No. 61/207,739 (Attorney Docket No. RALEP004+) entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed on February 13, 2009, U.S. Provisional Patent Application No. 61/252,151 (Attorney Docket No. RALEP025+) entitled SECURITY TECHNIQUES FOR DEVICE ASSISTED SERVICES, filed on October 15, 2009, and U.S. Provisional Patent Application No. 61/252,153 (Attorney Docket No. RALEP026+) entitled DEVICE GROUP PARTITIONS AND SETTLEMENT PLATFORM filed on October 15, 2009, which are incorporated herein by reference for all purposes.

BACKGROUND OF THE INVENTION

[0003] With the advent of mass market digital communications and content distribution, many access networks such as wireless networks, cable networks and DSL (Digital Subscriber Line) networks are pressed for user capacity, with, for example, EVDO (Evolution-Data Optimized), HSPA (High Speed Packet Access), LTE (Long Term Evolution), WiMax (Worldwide Interoperability for Microwave Access), and Wi-Fi (Wireless Fidelity) wireless networks increasingly becoming user capacity constrained. Although wireless network capacity will increase with new higher capacity wireless radio access technologies, such as MIMO (Multiple-Input Multiple-Output), and with more frequency spectrum being deployed in the future, these capacity gains are likely to be less than what is required to meet growing digital networking demand.

[0004] Similarly, although wire line access networks, such as cable and DSL, can have higher average capacity per user, wire line user service consumption habits are trending toward very high bandwidth applications that can quickly consume the available capacity and degrade overall network service experience. Because some components of service provider costs go up with increasing bandwidth, this trend will also negatively impact service provider profits.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] Various embodiments are disclosed in the following detailed description and the accompanying drawings.

[0006] **Figure 1** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing in accordance with some embodiments.

[0007] **Figure 2** illustrates another wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing in accordance with some embodiments.

[0008] **Figure 3** illustrates another wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing in accordance with some embodiments.

[0009] **Figure 4** illustrates provisioning of a wireless network for providing device assisted CDR creation, aggregation, mediation and billing in accordance with some embodiments.

[0010] **Figure 5** illustrates a network architecture for providing device assisted CDRs in accordance with some embodiments.

[0011] **Figure 6** illustrates another network architecture for providing device assisted CDRs in accordance with some embodiments.

[0012] **Figure 7** illustrates another network architecture for providing device assisted CDRs in accordance with some embodiments.

[0013] **Figure 8** illustrates another network architecture for providing device assisted CDRs in accordance with some embodiments.

[0014] **Figure 9** is a functional diagram illustrating a device based service processor and a service controller in accordance with some embodiments.

[0015] **Figure 10** provides a table summarizing various service processer functional elements in accordance with some embodiments.

[0016] **Figure 11** provides a table summarizing various service controller functional elements in accordance with some embodiments.

[0017] **Figure 12** illustrates a device stack providing various service usage measurement from various points in the networking stack for a service monitor agent, a billing agent, and an access control integrity agent to assist in verifying the service usage measures and billing reports in accordance with some embodiments.

[0018] **Figure 13** illustrates an embodiment similar to Figure 12 in which some of the service processor is implemented on the modem and some of the service processor is implemented on the device application processor in accordance with some embodiments.

[0019] **Figure 14** illustrates various embodiments of intermediate networking devices that include a service processor for the purpose of verifiable service usage measurement, reporting, and billing reports in accordance with some embodiments.

[0020] **Figure 15** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including a proxy server in accordance with some embodiments.

[0021] **Figure 16** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including a service provider network in accordance with some embodiments, involving one or more of service controllers, service processors, and/or proxy server/routers.

[0022] **Figure 17** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including a service provider network in accordance with some embodiments, involving one or more of service controllers, service processors, and/or proxy server/routers.

[0023] **Figure 18** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including a service provider network in

accordance with some embodiments, involving one or more of service controllers and/or proxy server/routers.

[0024] **Figure 19** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including two service provider networks in accordance with some embodiments.

[0025] **Figure 20** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including two service provider networks in accordance with some embodiments, involving one or more of service controllers and/or service processors.

[0026] **Figure 21** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including two service provider networks in accordance with some embodiments.

[0027] **Figure 22** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including two service provider networks in accordance with some embodiments, involving one or more of service controllers, service processors, and/or proxy server/routers.

[0028] **Figure 23** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including two service provider networks in accordance with some embodiments, involving one or more of service controllers and/or proxy server/routers.

DETAILED DESCRIPTION

[0029] The invention can be implemented in numerous ways, including as a process; an apparatus; a system; a composition of matter; a computer program product embodied on a computer readable storage medium; and/or a processor, such as a processor configured to execute instructions stored on and/or provided by a memory coupled to the processor. In this specification, these implementations, or any other form that the invention may take, may be referred to as techniques. In general, the order of the steps of disclosed processes may be altered within the scope of the invention. Unless stated otherwise, a component such as a processor or a memory described as being configured to perform a task may be implemented as a general component that is temporarily configured to perform the task at a given time or a specific component that is manufactured to perform the task. As used herein, the term 'processor' refers to one or more devices, circuits, and/or processing cores configured to process data, such as computer program instructions.

[0030] A detailed description of one or more embodiments of the invention is provided below along with accompanying figures that illustrate the principles of the invention. The invention is described in connection with such embodiments, but the invention is not limited to any embodiment. The scope of the invention is limited only by the claims and the invention encompasses numerous alternatives, modifications and equivalents. Numerous specific details are set forth in the following description in order to provide a thorough understanding of the invention. These details are provided for the purpose of example and the invention may be practiced according to the claims without some or all of these specific details. For the purpose of clarity, technical material that is known in the technical fields related to the invention has not been described in detail so that the invention is not unnecessarily obscured.

[0031] There are many new types of digital devices where it is becoming desirable, for example, to connect these devices to wireless networks including wireless wide area networks (WWAN, such as 3G and 4G) and/or wireless local area (WLAN) networks. These devices include, for example, consumer electronics devices, business user devices, and machine to machine devices that benefit from flexible wide area data connections and the Internet. Example devices include netbooks, notebooks, mobile Internet devices, personal navigation (e.g., GPS

enabled) devices, music and multimedia players, eReaders, industrial telemetry, automotive emergency response and diagnostics, 2-way home and industrial power metering and control, vending machines, parking meters, and many other devices. For example, it is highly advantageous to offer service usage and service billing plans for such devices that are more optimal for each type of device and each type of desired user experience. To accomplish this, more sophisticated service usage measuring and service usage billing systems are needed as compared to the conventional network based techniques in existence today. By providing more flexibility in service measurement and billing, more advantageous and cost effective service plans can be created for, for example, the new WWAN connected devices cited above for all three markets (e.g., consumer, business and machine to machine) that still maintain the necessary profit margins for the WWAN carriers to be successful with these various service businesses.

[0032] Accordingly, various embodiments disclosed herein provide for a new and flexible augmentation or replacement for existing carrier network service usage measurement, service usage accounting, and service usage billing systems and techniques.

[0033] A charging data record (CDR) is a term that as used herein defines a formatted measure of device service usage information, typically generated by one or more network functions or device functions that supervise, monitor, control, account for, charge for, report, synchronize usage accounting or records and/or bill for network access or other service or purchase transactions for the device. To simplify the discussion, the term charging data record or CDR is often used interchangeably herein to refer to several different types of service usage records. For example, the term CDR is used herein interchangeably with one or more of other industry terms or record types including, for example, CDRs, flow data records (FDRs), start/stop records, interim accounting records, IP data records (IPDRs), call data records, micro-CDRs, service charging bucket accounting records, record types that include usage information identifying QoS level, QoS class, and/or other QoS classifier, records that include usage information identifying traffic type or class or other traffic identifier, records that identify traffic protocol, records that identify usage or purchase transactions, records that report a purchase transaction, etc. One of ordinary skill in the art will appreciate that in many of the embodiments the term CDR and/or many other terms can be interchanged for a given application or purpose. Any of these terms can refer in various embodiments to the lowest level of usage accounting

records or can refer to various levels of charging record aggregation that may occur in the various network or device elements described herein.

[0034] CDRs typically form the basis for recording device network service usage, and often form the basis for billing for such usage. Various embodiments are provided herein for device assisted CDR creation, mediation, and billing. There are many limitations to the capabilities of service usage recording, aggregation and/or billing when CDRs are generated exclusively by network based functions or equipment. Accordingly, by either augmenting network based service usage measures with device based service usage measures, or by replacing network based service usage measures with device based service usage measures, it is possible to create a CDR generation, aggregation, mediation and/or billing solution that has superior or more desirable capabilities/features. While in theory, many of the service usage measures that can be evaluated on a device can also be evaluated in the network data path using various network equipment technologies including, for example, deep packet inspection (DPI), there are many examples where measuring service usage at the device is either more desirable or more practical, or in some cases it is the only way to obtain the desired measure. Such examples include but are not limited to the following:

- Application layer service usage measures (e.g., traffic usage categorized by application or by combinations of application, destination, and/or content type);
- Usage measures that do not involve user traffic but instead involve network overhead traffic (e.g., basic connection maintenance traffic, signaling traffic, network logon/AAA/authentication/monitoring traffic, service software update traffic);
- Usage that is associated with services that are charged to another entity other than the end user (e.g., basic network connection service offer traffic, traffic associated with providing network access to or downloading service marketing information, traffic associated with advertiser sponsored services, traffic associated with content provider sponsored services, 911 service traffic);
- Usage measures involving encrypted traffic (e.g., traffic that is run over encrypted networking protocols or between secure end points);

- Implementing service usage measure collection and/or service usage billing across multiple networks that may have different and in some cases incompatible, inaccessible (to the CDR system of record) or incomplete service usage measurement capabilities;
- Service usage measurement and/or service usage billing capabilities that are not supported by the present network gateways, routers, MWC/HLRs, AAA, CDR aggregation, CDR mediation, billing and/or provisioning systems;
- New service usage measures and/or new service usage billing capabilities that are desirable to implement in a manner that does not require major changes or upgrades to the existing network gateways, routers, MWC/HLRs, AAA, CDR aggregation, CDR mediation, billing and/or provisioning systems;
- New service usage measures and/or new service usage billing capabilities that are desirable to implement in a manner that allows for rapid definition and implementation of new service measures and/or billing plans;
- New service usage measures and/or new service usage billing capabilities that are desirable to implement in a manner that may be implemented in a manner that enables multiple device group definitions in which each device group gets a customized programmable definition for service usage collection, accounting and/or billing;
- Multi device billing;
- Multi user billing;
- Intermediate device billing with single user and multi user with and without multi device;
- Content downloads from a specific source to a specific application with the content being of a specific type or even identified down to a particular content ID; and/or
- Various other single event transactions used for billing purposes.

For these and other reasons, it is desirable to provide a system/process that utilizes device assisted service usage measures that provides either an enhancement of existing network based service usage CDR system capabilities and techniques and/or a replacement for network based CDR system capabilities and techniques.

[0035] In some embodiments, techniques, such as a system and/or process, that utilize device assisted service usage measures include one or more of the following: (1) receiving a service usage measure from a device in communication with a wireless network, (2) verifying or

protecting the validity of the service usage measure, (3) generating a CDR based on the service usage measure (e.g., device assisted CDR), (4) aggregating CDRs, and (5) mediating the CDR with network CDRs. In some embodiments, the techniques also include providing a design and provisioning of devices/network equipment to recognize the CDRs. In some embodiments, the techniques also include provisioning to recognize that the device belongs to a Device Assisted Services (DAS) device group and that corresponding CDRs should be accepted and mediated. In some embodiments, the device assisted CDRs are also generated using formats, network communications protocols, network device authentication and/or provisioning to allow device assisted CDRs into the network CDR system, encryption, and/or signatures as required by the network (e.g., to comply with network generated CDR requirements or based on any other network and/or service provider requirements and/or standards).

[0036] In some embodiments, mediation rules include multi device, multi user, single user devices, and/or intermediate networking devices that can be single user or multi user, as described herein.

[0037] In some embodiments, a device assisted CDR generator collects device based service usage measures that are used as the basis for, or as an enhancement (e.g., as a supplement or in addition) to, one or more (e.g., network generated) CDRs that provide one or more networking functions with properly formatted service usage reports that the network function(s) accepts as being transmitted from an authorized source, read, and utilized for helping to determine the service usage of a device or group of devices. In some embodiments, the network functions that the device assisted CDR generator shares CDRs with typically include one or more of the following: service usage/CDR aggregation and/or mediation servers, gateways, routers, communication nodes, Mobile Wireless Centers (MWCs, including HLRs), databases, AAA systems, billing interfaces, and billing systems. For example, the process of CDR creation in the CDR generator typically includes either using one or more device based measures of service usage, or one or more device based measures of service usage in combination with one or more network based measures of service usage, possibly processing one or more of such service usage measures according to a set of CDR creation, CDR aggregation, and/or CDR mediation rules to arrive at a final device usage measure that is, for example, then formatted with the proper syntax, framed, possibly encrypted and/or signed, and encapsulated in a communication protocol or

packet suitable for sharing with network functions. In some embodiments, the CDR generator resides in the device. In some embodiments, the CDR generator resides in a network server function that receives the device assisted service usage measures, along with possibly network based usage measures, and then creates a CDR (e.g., in the service controller 122).

[0038] In some embodiments, the device assisted CDR generator can reside in the service processor (e.g., service processor 115), for example, in the service usage history or billing server functions. In some embodiments, the device assisted CDR generator resides in the device itself, for example, within the service processor functions, such as the billing agent or the service monitor agent.

[0039] There are several factors that are considered in the various embodiments in order to create a useful, reliable, and secure device assisted CDR system, including, for example, but not limited to:

- Identification of each device based service usage measure with one or more usage transaction codes;
- Verification of the device based usage measure(s);
- Secure communication of the device based usage measures to the network;
- Efficient (e.g., low bandwidth) communication of the device based service usage measure;
- Coordination/comparison/aggregation of the device based service usage measure with network based service usage measure(s);
- Formatting the device based service usage measure into a CDR that can be properly communicated to the network functions and/or equipment that process service usage information;
- Causing the network based functions and/or equipment used for CDR collection, aggregation, mediation and/or billing to recognize, authorize, and accept communications and CDRs from the device assisted CDR generator, reading and properly implementing the correct network session context for the CDR so that the CDR is properly associated with the correct device /user/session;

- Implementing the CDR aggregation rules that determine how to collect and aggregate the device assisted CDRs as they are reported through the network CDR system hierarchy;
- Implementing the mediation rules that determine how the various device based service usage transaction code measures are combined and mediated with the other device based service usage transaction code measures to result in consistent service usage information for each of the transaction code categories maintained in the network;
- Implementing the mediation rules that determine how the device assisted CDRs are combined and mediated with network based CDRs to result in consistent service usage information for each of the transaction code categories maintained in the network;
- Implementing mediation rules to reconcile the variances between network based CDR usage measures and device assisted CDR usage measures;
- Classification of one or more device groups, with each group having the capability to uniquely define the service usage collection, accounting, and/or billing rules;
- Collecting CDRs generated on networks other than the home network so that service usage may be measured, accounted for, and/or billed for across multiple networks;
- Multi device billing;
- Multi user billing; and/or
- Intermediate device billing with single user and multi user with and without multi device.

[0040] In some embodiments, verification of the relative accuracy of the device assisted service usage measure is provided. Given that, for example, the service usage measure is often being generated on an end user device or a device that is readily physically accessed by the general public or other non-secure personnel from a network management viewpoint, in some embodiments, the device agents used in one or more of the service processor 115 agents are protected from hacking, spoofing, and/or other misuse. Various techniques are provided herein for protecting the integrity of the agents used for generating the device assisted service usage measures.

[0041] In some embodiments, the service usage measures are verified by network based cross checks using various techniques. For example, network based cross checks can provide valuable verification techniques, because, for example, it is generally not possible or at least very difficult to defeat well designed network based cross checks using various techniques, such as

those described herein, even if, for example, the measures used to protect the device agents are defeated or if no device protection measures are employed. In some embodiments, network based cross checks used to verify the device assisted service usage measures include comparing network based service usage measures (e.g., CDRs generated by service usage measurement apparatus in the network equipment, such as the BTS/BSCs 125, RAN Gateways 410, Transport Gateways 420, Mobile Wireless Center/HLRs 132, AAA 121, Service Usage History/CDR Aggregation, Mediation, Feed 118, or other network equipment), sending secure query/response command sequences to the service processor 115 agent(s) involved in device assisted CDR service usage measurement or CDR creation, sending test service usage event sequences to the device and verifying that the device properly reported the service usage, and using various other techniques, such as those described herein with respect to various embodiments.

[0042] In some embodiments, one or more of the following actions are taken if the device based service usage measure is found to be in error or inaccurate: bill the user for usage overage or an out of policy device, suspend the device, quarantine the device, SPAN the device, and/or report the device to a network administration function or person.

[0043] In some embodiments, the CDR syntax used to format the device assisted service usage information into a CDR and/or network communication protocols for transmitting CDRs are determined by industry standards (e.g., various versions of 3GPP TS 32.215 format and 3GPP2 TSG-X X.S0011 or TIA-835 format). In some embodiments, for a given network implementation the network designers will specify modifications of the standard syntax, formats and/or network communication/transmission protocols. In some embodiments, for a given network implementation the network designers will specify syntax, formats, and/or network communication/transmission protocols that are entirely different than the standards.

[0044] In some embodiments, within the syntax and formatting for the CDR the device assisted service usage is typically categorized by a transaction code. For example, the transaction code can be similar or identical to the codes in use by network equipment used to generate CDRs, or given that the device is capable of generating a much richer set of service usage measures, the transaction codes can be a superset of the codes used by network equipment used to generate CDRs (e.g., examples of the usage activities that can be labeled as transaction

codes that are more readily supported by device assisted CDR systems as compared to purely network based CDR systems are provided herein).

[0045] In some embodiments, the device sends an identifier for a usage activity tag, an intermediate server determines how to aggregate into CDR transaction codes and which CDR transaction code to use.

[0046] In some embodiments, the device service processor 115 compartmentalizes usage by pre-assigned device activity transaction codes (e.g., these can be sub-transactions within the main account, transactions within a given bill-by-account transaction or sub-transactions within a bill-by-account transaction). The device implements bill-by-account rules to send different usage reports for each bill-by-account function. In some embodiments, the service controller 122 programs the device to instruct it on how to compartmentalize these bill-by-account service usage activities so that they can be mapped to a transaction code.

[0047] In some embodiments, the device reports less compartmentalized service usage information and the service controller 122 does the mapping of service usage activities to CDR transaction codes, including in some cases bill-by-account codes.

[0048] In some embodiments, the CDR sent to 118 or other network equipment, for example, can include various types of transaction codes including, for example, a raw device usage CDR, a bill-by-account (e.g., a sub-activity transaction code) CDR, a billing offset CDR, and/or a billing credit CDR. For example, the decision logic (also referred to as business rules or CDR aggregation and mediation rules) that determines how these various types of CDR transaction codes are to be aggregated and mediated by the core network and the billing system can be located in the network equipment (e.g., a network element, such as service usage 118), in the service controller 122, and/or in the billing system 123.

[0049] In some embodiments, the device assisted CDR generator uses the device assisted service usage measures to generate a CDR that includes service usage information, service usage transaction code(s), and, in some embodiments, network information context. In some embodiments, the service usage information, transaction code, and/or network information context is formatted into communication framing, syntax, encryption/signature, security and/or

networking protocols that are compatible with the formatting used by conventional networking equipment to generate CDRs. For example, this allows networking equipment used for CDR collection, recording, aggregation, mediation, and/or conversion to billing records to properly accept, read, and interpret the CDRs that are generated with the assistance of device based service usage measurement. In some embodiments, the device assisted service measures are provided to an intermediate network server referred to as a service controller (e.g., service controller 122). In some embodiments, the service controller uses a CDR feed aggregator for a wireless network to collect device generated usage information for one or more devices on the wireless network; and provides the device generated usage information in a syntax (e.g., charging data record (CDR)), and a communication protocol (e.g., 3GPP or 3GPP2, or other communication protocol(s)) that can be used by the wireless network to augment or replace network generated usage information for the one or more devices on the wireless network.

[0050] In some embodiments, mediation rules include multi device, multi user, single user devices, intermediate networking devices that can be single user or multi user. For example, the device assisted CDRs can be formatted by the device assisted CDR generator to include a transaction code for one user account, even though the CDRs originate from multiple devices that all belong to the same user. This is an example for a multi-user device assisted CDR billing solution. In another example for a multi-user device assisted CDR billing solution, device assisted CDRs from multiple devices and multiple users can all be billed to the same account (e.g., a family plan or a corporate account), but the bill-by-account CDR transaction records can be maintained through the billing system so that sub-account visibility is provided so that the person or entity responsible for the main account can obtain visibility about which users and/or devices are creating most of the service usage billing. For example, this type of multi-user, multi-device device assisted CDR billing solution can also be used to track types of service usage and/or bill for types of service usage that are either impossible or at least very difficult to account and/or bill for with purely network based CDR systems. In some embodiments, bill-by-account CDR transaction records can be used to provide sponsored transaction services, account for network chatter, provide service selection interfaces, and other services for multi-user or multi-device service plans.

[0051] In addition to conventional single user devices (e.g., cell phones, smart phones, netbooks/notebooks, mobile internet devices, personal navigation devices, music players, electronic eReaders, and other single user devices) device assisted service usage measurement and CDRs are also useful for other types of network capable devices and/or networking devices, such as intermediate networking devices (e.g., 3G/4G WWAN to WLAN bridges/routers/gateways, femto cells, DOCSIS modems, DSL modems, remote access/backup routers, and other intermediate network devices). For example, in such devices, particularly with a secure manner to verify that the device assisted service usage measures are relatively accurate and/or the device service processor 115 software is not compromised or hacked, many new service provider service delivery and billing models can be supported and implemented using the techniques described herein. For example, in a WiFi to WWAN bridge or router device multiple user devices can be supported with the same intermediate networking device in a manner that is consistent and compatible with the central provider's CDR aggregation and/or billing system by sending device assisted CDRs as described herein that have a service usage and/or billing code referenced to the end user and/or the particular intermediate device.

[0052] In some embodiments, the device assisted CDRs generated for the intermediate networking device are associated with a particular end user in which there can be several or many end users using the intermediate networking device for networking access, and in some embodiments, with each end user being required to enter a unique log-in to the intermediate networking device. For example, in this way, all devices that connect using WiFi to the intermediate networking device to get WWAN access generate CDRs can either get billed to a particular end user who is responsible for the master account for that device, or the CDRs can get billed in a secure manner, with verified relative usage measurement accuracy to multiple end users from the same intermediate networking device. In another example, an end user can have one account that allows access to a number of intermediate networking devices, and each intermediate networking device can generate consistent device assisted CDRs with transaction codes for that end user regardless of which intermediate networking device the end user logs in on.

[0053] In some embodiments, some of the services provided by the intermediate networking device are billed to a specific end user device assisted CDR transaction code, while

other bill-by-account services are billed to other transaction code accounts, such as sponsored partner transaction service accounts, network chatter accounts, sponsored advertiser accounts, and/or service sign up accounts. For example, in this manner, various embodiments are provided in which intermediate networking devices (e.g., a WWAN to WiFi router/bridge) can sold to one user but can service and be used to bill other users (e.g., and this can be covered in the first purchasing user's service terms perhaps in exchange for a discount), or such intermediate networking devices can be located wherever access is desired without concern that the device will be hacked into so that services can be acquired without charge.

[0054] In some embodiments, various types of service usage transactions are billed for on the intermediate networking device, to any of one or more users, in which the information required to bill for such services is not available to the central provider or MVNO network equipment, just as is the case with, for example, conventional single user devices. In view of the various embodiments and techniques described herein, those skilled in the art will appreciate that similar service models are equally applicable not just to WWAN to WiFi intermediate networking devices, but also to the Femto Cell, remote access router, DOCSIS, DSL and other intermediate WWAN to WiFi networking devices.

[0055] **Figure 1** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing in accordance with some embodiments. As shown, Figure 1 includes a 4G/3G/2G wireless network operated by, for example, a central provider. As shown, various wireless devices 100 are in communication with base stations 125 for wireless network communication with the wireless network, and other devices 100 are in communication with Wi-Fi Access Points (APs) or Mesh 702 for wireless communication to Wi-Fi Access CPE 704 in communication with central provider access network 109. In some embodiments, each of the wireless devices 100 includes a service processor 115 (as shown), and each service processor connects through a secure control plane link to a service controller 122. In some embodiments, the network based service usage information (e.g., CDRs) is obtained from one or more network elements. As shown, an MVNO core network 210 also includes a CDR storage, aggregation, mediation, feed 118, a MVNO billing interface 122, and a MVNO billing system 123 (and other network elements as shown in Figure 1). A Virtual Service Provider Work Station 4910 (also referred to herein as a service design interface) provides a user

interface to central provider service designers, MVNO service designers or other service designers for the purpose of simplifying and organizing the process of service design as described herein.

[0056] As shown in Figure 1, a CDR storage, aggregation, mediation, feed 118 (e.g., service usage 118, including a billing aggregation data store and rules engine) is a functional descriptor for, in some embodiments, a device/network level service usage information collection, aggregation, mediation, and reporting function located in one or more of the networking equipment components attached to one or more of the sub-networks shown in Figure 1 (e.g., central provider access network 109 and/or central provider core network 110), which is in communication with the service controller 122, and a central billing interface 127. As shown in Figure 1, service usage 118 is shown as a function in communication with the central provider core network 110. In some embodiments, the CDR storage, aggregation, mediation, feed 118 function is located elsewhere in the network or partially located in elsewhere or integrated with as part of other network elements. In some embodiments, CDR storage, aggregation, mediation, feed 118 functionality is located or partially located in the AAA server 121 and/or the mobile wireless center/Home Location Register(HLR) 132 (as shown, in communication with a DNS/DHCP server 126). In some embodiments, service usage 118 functionality is located or partially located in the base station, base station controller and/or base station aggregator, collectively referred to as base station 125 in Figure 1. In some embodiments, CDR storage, aggregation, mediation, feed 118 functionality is located or partially located in a networking component in the central provider access network 109, a networking component in the core network 110, the central billing system 123, the central billing interface 127, and/or in another network component or function. This discussion on the possible locations for the network based and device based service usage information collection, aggregation, mediation, and reporting function (e.g., CDR storage, aggregation, mediation, feed 118) can be easily generalized as described herein and as shown in the other figures described herein by one of ordinary skill in the art. Also as shown in Figure 1, the service controller 122 is in communication with the central billing interface 123 (also sometimes referred to as the external billing management interface or billing communication interface) 127, which is in communication with the central billing system 123. As shown, an order management 180 and subscriber management 182 are

also in communication with the central provider core network 110 for facilitating order and subscriber management of services for the devices 100 in accordance with some embodiments.

[0057] In some embodiments, the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) provides a device/network level service usage information collection, aggregation, mediation, and reporting function. In some embodiments, the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) collects device generated usage information for one or more devices on the wireless network (e.g., devices 100); and provides the device generated usage information in a syntax and a communication protocol that can be used by the wireless network to augment or replace network generated usage information for the one or more devices on the wireless network. In some embodiments, the syntax is a charging data record (CDR), and the communication protocol is selected from one or more of the following: 3GPP, 3GPP2, or other communication protocols. In some embodiments, the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) includes a service usage data store (e.g., a billing aggregator) and a rules engine for aggregating the collected device generated usage information. In some embodiments, the syntax is a charging data record (CDR), and the network device is a CDR feed aggregator, and the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) also aggregates CDRs for the one or more devices on the wireless network; applies a set of rules to the aggregated CDRs using a rules engine (e.g., bill by account, transactional billing, and/or any other billing or other rules for service usage information collection, aggregation, mediation, and reporting), and communicates a new set of CDRs for the one or more devices on the wireless network to a billing interface or a billing system (e.g., providing a CDR with a billing offset by account/service). In some embodiments, the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) communicates a new set of CDRs for the one or more devices on the wireless network to a billing interface or a billing system. In some embodiments, the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) communicates with a service controller to collect the device generated usage information for the one or more devices on the wireless network. In some embodiments, the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations

of network elements) communicates with a service controller, in which the service controller is in communication with a billing interface or a billing system. In some embodiments, the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) communicates the device generated usage information to a billing interface or a billing system. In some embodiments, the CDR storage, aggregation, mediation, feed (and/or other network elements or combinations of network elements) communicates with a transport gateway and/or a Radio Access Network (RAN) gateway to collect the network generated usage information for the one or more devices on the wireless network. In some embodiments, the service controller 122 communicates the device generated service usage information to the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements).

[0058] In some embodiments, the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) performs rules for performing a bill by account aggregation and mediation function. In some embodiments, the service controller 122 in communication with the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) performs a rules engine for aggregating and mediating the device generated usage information. In some embodiments, a rules engine device in communication with the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) performs a rules engine for aggregating and mediating the device generated usage information.

[0059] In some embodiments, the rules engine is included in (e.g., integrated with/part of) the CDR storage, aggregation, mediation, feed 118. In some embodiments, the rules engine and associated functions, as described herein, is a separate function/device. In some embodiments, the service controller 122 performs some or all of these rules engine based functions, as described herein, and communicates with the central billing interface 127. In some embodiments, the service controller 122 performs some or all of these rules engine based functions, as described herein, and communicates with the central billing system 123.

[0060] In some embodiments, duplicate CDRs are sent from the network equipment to the billing system 123 that is used for generating service billing. In some embodiments,

duplicate CDRs are filtered to send only those CDRs/records for devices controlled by the service controller and/or service processor (e.g., the managed devices). For example, this approach can provide for the same level of reporting, lower level of reporting, and/or higher level of reporting as compared to the reporting required by the central billing system 123.

[0061] In some embodiments, a bill-by-account billing offset is provided. For example, bill-by-account billing offset information can be informed to the central billing system 123 by providing a CDR aggregator feed that aggregates the device based service usage data feed to provide a new set of CDRs for the managed devices to the central billing interface 127 and/or the central billing system 123. In some embodiments, transaction billing is provided using similar techniques. For example, transaction billing log information can be provided to the central billing interface 127 and/or the central billing system 123.

[0062] In some embodiments, the rules engine (e.g., performed by the service usage 118 or another network element, as described herein) provides a bill-by-account billing offset. For example, device generated usage information (e.g., charging data records (CDRs)) includes a transaction type field (e.g., indicating a type of service for the associated service usage information). The rules engine can apply a rule or a set of rules based on the identified service associated with the device generated usage information to determine a bill-by-account billing offset (e.g., a new CDR can be generated to provide the determined bill-by-account billing offset). In some examples, the determined bill-by-account billing offset can be provided as a credit to the user's service usage account (e.g., a new CDR can be generated with a negative offset for the user's service usage account, such as for network chatter service usage, or transactional service usage, or for any other purposes based on one or more rules performed by the rules engine).

[0063] As another example, for a transactional service, a first new CDR can be generated with a negative offset for the user's service usage account for that transactional service related usage, and a second new CDR can be generated with a positive service usage value to charge that same service usage to the transactional service provider (e.g., Amazon, eBay, or another transactional service provider). In some embodiments, the service controller 122 generates these two new CDRs, and the service usage 118 stores, aggregates, and communicates these two new

CDRs to the central billing interface 127. In some embodiments, the service controller 122 generates these two new CDRs, and the service usage 118 stores, aggregates, and communicates these two new CDRs to the central billing interface 127, in which the central billing interface 127 applies rules (e.g., performs the rules engine for determining the bill-by-account billing offset).

[0064] In some embodiments, the service controller 122 sends the device generated CDRs to the rules engine (e.g., service usage 118), and the rules engine applies one or more rules, such as those described herein and/or any other billing/service usage related rules as would be apparent to one of ordinary skill in the art. In some embodiments, the service controller 122 generates CDRs similar to other network elements, and the rules (e.g., bill-by-account) are performed in the central billing interface 127. For example, for the service controller 122 to generate CDRs similar to other network elements, in some embodiments, the service controller 122 is provisioned on the wireless network and behaves substantially similar to other CDR generators on the network) as would be apparent to one of ordinary skill in the art.

[0065] In some embodiments, the service controller 122 is provisioned as a new type of networking function that is recognized as a valid and secure source for CDRs by the other necessary elements in the network (e.g., the Service Usage History/ CDR Aggregation and Mediation Server 118). In some embodiments, in which the network apparatus typically only recognize CDRs from certain types of networking equipment (e.g., RAN Gateway 410 or Transport Gateway 420 (as shown in Figure 3)), then the Service Controller 122 can provide authentication credentials to the other networking equipment that indicate it is one of the approved types of equipment (e.g., for purposes of generating/providing CDRs). In some embodiments, the link between the Service Controller 122 and the necessary CDR aggregation and mediation equipment is secured, authenticated, encrypted and/or signed.

[0066] In some embodiments, the CDR storage, aggregation, mediation, feed 118 discards the network based service usage information (e.g., network based CDRs) received from one or more network elements. In these embodiments, the service controller 122 can provide the device based service usage information (e.g., device based CDRs) to the CDR storage, aggregation, mediation, feed 118 (e.g., the CDR storage, aggregation, mediation, feed 118 can

just provide a store, aggregate, and communication function(s)), and the device based service usage information is provided to the central billing interface 127 or the central billing system 123.

[0067] In some embodiments, the device based CDRs and/or new CDRs generated based on execution of a rules engine as described herein is provided only for devices that are managed and/or based on device group, service plan, or any other criteria, categorization, and/or grouping.

[0068] **Figure 2** illustrates another wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing in accordance with some embodiments. As shown in Figure 2, some devices 100 are in communication with DOCSIS Head End 125 and some devices 100 are in communication with DSLAM 125, which are in communication with the central provider access network 109.

[0069] **Figure 3** illustrates another wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing in accordance with some embodiments. Referring now to the 4G/3G/2G access network as shown in Figure 3, the 4G/3G and 3G/2G base stations/nodes 125 are in communication with a 4G/3G/2G Radio Access Network (RAN) gateway 410 via a radio access network 405, which are in communication with a 4G/3G/2G transport gateway 420 via an access transport network 415. The central provider core network 110 is in network communication with the access transport network 415 (e.g., via a dedicated/leased line, and as shown, via a firewall 124). The Internet, data, and/or phone network 120 is available via a firewall 124 and the transport gateway(s) 420, as shown. Also, as shown, a network apparatus provisioning system 160, order management 180, and subscriber management 182 are in communication with the central provider core network 110. As shown, a AAA server 121, a mobile wireless center/Home Location Register(HLR) 132, a DNS/DHCP 126, and CDR storage, aggregation, mediation, feed 118 are also in communication with the access transport network 415. The central billing system 123 and the central billing interface 127 are shown in communication with the central provider core network 110.

[0070] As shown, Figure 3 includes a 4G/3G/2G wireless network operated by, for example, a central provider. In some embodiments, each of the wireless devices 100 includes a service processor 115 (as shown), and each service processor connects through a secure control

plane link to a service controller 122. In some embodiments, the network based service usage information (e.g., network generated CDRs) is obtained from Radio Access Network (RAN) gateway(s) 410 and/or transport gateway(s) 420. In some embodiments, device based service usage information (e.g., device assisted CDRs) are generated by the service processor 115 and/or service controller 122 for some or all of the wireless devices 100 using similar techniques as described herein, and in some embodiments, such device based service usage information (e.g., device assisted CDRs) is sent to the CDR storage, aggregation, mediation, feed 118 (e.g., the CDR storage, aggregation, mediation, feed 118 can just provide a store, aggregate, and communication function(s)), and/or to the central billing interface 127 or the central billing system 123, as similarly described herein with respect to various embodiments.

[0071] **Figure 4** illustrates provisioning of a wireless network for providing device assisted CDR creation, aggregation, mediation and billing in accordance with some embodiments. As shown in Figure 4, the provisioning of various network equipment is provided as shown to recognize each other as an authorized source of CDRs (e.g., this can be done manually or in an automated manner). For example, order management 180, subscriber management, billing interface 127, billing system 123, network provisioning system 160, service controller 122, access network AAA server 121, mobile wireless center 132, and CDR storage, aggregation, mediation feed 118 communicate with each other for such provisioning, which can be implemented using various techniques. In some embodiments, the various network elements are provisioned to recognize device assisted CDRs being generated by the service controller 122, which, for example, can be provided to the billing interface 127 and/or the billing system 123. In some embodiments, network generated CDRs are provided by RAN/Access gateway 410, aggregation/transport gateway 425, and/or base station controller 125. In some embodiments, other network elements generate/receive/store device assisted CDRs.

[0072] In some embodiments, provisioning of various network equipment is provided to recognize a given device as belonging to a device group that supports a service usage and/or billing plan that relies upon and/or utilizes device assisted CDRs.

[0073] In some embodiments, the CDR formats, transaction codes, and CDR transmission destinations are programmed for each device that generates CDRs, including the

service controller 122 (e.g., in some embodiments, the service controller 122 is the intermediary for CDRs) and/or service processor 115 (e.g., in some embodiments, the device sends CDRs to network CDR aggregation or billing interface 127/billing system 123 with no intermediate server function).

[0074] While Figures 4 through 8 provide various embodiments in the context of wireless 3G/4G networks, it will be apparent to one of ordinary skill in the art that these techniques can similarly be applied to other types of access networks including, for example, WiFi, cable, DSL, fiber, satellite, and/or other networks.

[0075] **Figure 5** illustrates a network architecture for providing device assisted CDRs in accordance with some embodiments. As shown, network generated CDRs are sent from various network elements to the CDR storage, aggregation, mediation, feed 118 and the service controller 122, as shown in dashed lines with arrows in Figure 5. In some embodiments, the network generated CDRs are used for verification of device assisted service (DAS) usage and/or billing information. In some embodiments, the network generated CDRs are provided to the service controller 122, and the service controller 122 implements aggregation and/or mediation rules to examine and, in some cases, aggregate and/or mediate network generated/based CDRs with device assisted/based CDRs.

[0076] In some embodiments, device assisted CDRs are sent from the service controller 122 to CDR storage, aggregation, mediation, feed 118 and communicated to the billing system 123, as shown in solid lines with arrows in Figure 5. In some embodiments, CDR storage, aggregation, mediation, feed 118 uses DAS service usage CDRs to augment network generated/based CDRs with bill-by-account transaction codes (e.g., as similarly described herein). In some embodiments, CDR storage, aggregation, mediation, feed 118 implements aggregation and/or mediation rules to account for DAS CDR usage amount in a new bill-by-account transaction code and removes the same service usage amount from the bulk device account transaction code. In some embodiments, a first DAS CDR is sent for the new bill by account transaction code, and a second DAS CDR is sent to be used as a correction (credit) to the main device usage account transaction code, and CDR storage, aggregation, mediation, feed 118 implements the rules to perform this mediation. In some embodiments, a first DAS CDR is used

for a given bill-by-account transaction code, and a second DAS CDR is used as the main device account transaction code, in which the service controller 122 (or device) has already implemented the mediation rules so that CDR storage, aggregation, mediation, feed 118 simply passes such DAS CDRs to billing after aggregating them.

[0077] **Figure 6** illustrates another network architecture for providing device assisted CDRs in accordance with some embodiments. Figure 6 also shows the communication of device assisted CDRs and network generated CDRs using solid and dashed lines with arrows, respectively. As shown, in some embodiments, CDR storage, aggregation, mediation, feed 118 sends network based CDRs to service controller 122 for various purposes, such as those previously described herein.

[0078] In some embodiments, service controller 122 sends DAS CDRs to billing for various uses by the billing system 123. In some embodiments, the billing system 123 uses DAS service usage CDRs to augment network based CDRs with bill-by-account transaction codes. In some embodiments, the billing system 123 implements aggregation and/or mediation rules to account for DAS CDR usage amount in a new bill-by-account transaction code and removes the same service usage amount from the bulk device account transaction code. In some embodiments, a first DAS CDR is sent for the new bill by account transaction code, and a second DAS CDR is sent to be used as a correction (credit) to the main device usage account transaction code, and the billing system 123 implements the rules to perform this mediation. In some embodiments, a first DAS CDR is used for a given bill-by-account transaction code, and a second is used as the main device account transaction code, in which the service controller 122 (or device) has already implemented the mediation rules so that the billing system 123 simply passes such DAS CDRs after aggregating them.

[0079] **Figure 7** illustrates another network architecture for providing device assisted CDRs in accordance with some embodiments. Figure 7 also shows the communication of device assisted CDRs and network generated CDRs using solid and dashed lines with arrows, respectively. Figure 7 is similar to Figure 6, except as shown in Figure 7, service usage information is passed through the billing interface 127 instead of the billing CDR aggregation interface. For example, the service usage detailed bill-by-account information and offset (credit)

information can be formatted as a CDR or can be formatted in a higher level syntax as required by the billing interface 127.

[0080] **Figure 8** illustrates another network architecture for providing device assisted CDRs in accordance with some embodiments. Figure 8 also shows the communication of device assisted CDRs and network generated CDRs using solid and dashed lines with arrows, respectively. In some embodiments, as shown in Figure 8, the central provider need not modify the existing CDR storage, aggregation, mediation, feed 118, so the additional aggregation and mediation rules discussed above with respect to Figure 5 are implemented as a new layer of rules in a new network function, shown as secondary DAS CDR aggregation mediation 118A, that is located between the billing system and the CDR storage, aggregation, mediation, feed 118. For example, this new network function (e.g., secondary DAS CDR aggregation mediation 118A) can reside in the network (as shown) or in the service processor 115, in the service controller 122, or elsewhere in the network or on the device. In some embodiments, the CDRs described herein include QoS tagging information specifying the QoS level for the service usage. In these embodiments, a service controller (e.g., or other network element providing similar functions for this purpose) is used to provide a centralized function to collect and organize QoS tagged charging records and aggregate, format and/or mediate those records into a format that is compatible with and can be processed by a billing system. In some embodiments, a service controller is used for collection, mediation, and/or transmission to billing of device assisted charging records that include charging level.

[0081] In some embodiments, charging records that include QoS tags are used to verify QoS policy adherence in the device. In some embodiments, charging records that include QoS tags are used to verify QoS policy adherence in other network elements (e.g., proxy router or server, other network elements that reserve, establish, provision or control QoS channels). In some embodiments, the QoS policies being verified are one or more of QoS level authorization policy, QoS request policy, QoS reservation policy, QoS provisioning policy, QoS control policy, QoS charging or accounting policy, QoS billing policy, QoS roaming policy, and/or QoS notification policy.

[0082] In some embodiments, a service controller (e.g., or other network element providing similar functions for this purpose) is used for collection, aggregation and/or transmission of QoS tagged usage records for the purpose of displaying to a user interface to inform a user of status of QoS related charging, accounting, service plan and/or billing. In some embodiments, the user interface is a device user interface. In some embodiments, the user interface is an web site user interface.

[0083] In some embodiments, a service controller (e.g., or other network element providing similar functions for this purpose) is used for collection, aggregation, and/or transmission of QoS tagged usage records for the purpose of synchronizing a user interface to inform a user of status of QoS related charging, accounting, service plan, and/or billing.

[0084] **Figure 9** is a functional diagram illustrating a device based service processor 115 and a service controller 122 in accordance with some embodiments. For example, this provides relatively full featured device based service processor implementation and service controller implementation. As shown, this corresponds to a networking configuration in which the service controller 122 is connected to the Internet, data, and/or phone network 120 and not directly to the access network 1610. As shown, a data plane (e.g., service traffic plane) communication path is shown in solid line connections and control plane (e.g., service control plane) communication path is shown in dashed line connections. As will be apparent, the division in functionality between one device agent and another is based on, for example, design choices, networking environments, devices and/or services/applications, and various different combinations can be used in various different implementations. For example, the functional lines can be re-drawn in any way that the product designers see fit. As shown, this includes certain divisions and functional breakouts for device agents as an illustrative implementation, although other, potentially more complex, embodiments can include different divisions and functional breakouts for device agent functionality specifications, for example, in order to manage development specification and testing complexity and workflow. In addition, the placement of the agents that operate, interact with or monitor the data path can be moved or re-ordered in various embodiments. For example, the functional elements shown in Figure 9 are described below with respect to Figures 10 and 11.

[0085] As shown in Figure 9, service processor 115 includes a service control device link 1691. For example, as device based service control techniques involving supervision across a network become more sophisticated, it becomes increasingly important to have an efficient and flexible control plane communication link between the device agents and the network elements communicating with, controlling, monitoring, or verifying service policy. In some embodiments, the service control device link 1691 provides the device side of a system for transmission and reception of service agent to/from network element functions. In some embodiments, the traffic efficiency of this link is enhanced by buffering and framing multiple agent messages in the transmissions. In some embodiments, the traffic efficiency is further improved by controlling the transmission frequency or linking the transmission frequency to the rate of service usage or traffic usage. In some embodiments, one or more levels of security or encryption are used to make the link robust to discovery, eavesdropping or compromise. In some embodiments, the service control device link 1691 also provides the communications link and heartbeat timing for the agent heartbeat function. As discussed below, various embodiments disclosed herein for the service control device link 1691 provide an efficient and secure solution for transmitting and receiving service policy implementation, control, monitoring and verification information with other network elements.

[0086] As shown in Figure 9, the service controller 122 includes a service control server link 1638. In some embodiments, device based service control techniques involving supervision across a network (e.g., on the control plane) are more sophisticated, and for such it is increasingly important to have an efficient and flexible control plane communication link between the device agents (e.g., of the service processor 115) and the network elements (e.g., of the service controller 122) communicating with, controlling, monitoring, or verifying service policy. For example, the communication link between the service control server link 1638 of service controller 122 and the service control device link 1691 of the service processor 115 can provide an efficient and flexible control plane communication link, a service control link 1653 as shown in Figure 9, and, in some embodiments, this control plane communication link provides for a secure (e.g., encrypted) communications link for providing secure, bidirectional communications between the service processor 115 and the service controller 122. In some embodiments, the service control server link 1638 provides the network side of a system for transmission and reception of service agent to/from network element functions. In some

embodiments, the traffic efficiency of this link is enhanced by buffering and framing multiple agent messages in the transmissions (e.g., thereby reducing network chatter). In some embodiments, the traffic efficiency is further improved by controlling the transmission frequency and/or linking the transmission frequency to the rate of service usage or traffic usage. In some embodiments, one or more levels of security and/or encryption are used to secure the link against potential discovery, eavesdropping or compromise of communications on the link. In some embodiments, the service control server link 1638 also provides the communications link and heartbeat timing for the agent heartbeat function.

[0087] In some embodiments, the service control server link 1638 provides for securing, signing, encrypting and/or otherwise protecting the communications before sending such communications over the service control link 1653. For example, the service control server link 1638 can send to the transport layer or directly to the link layer for transmission. In another example, the service control server link 1638 further secures the communications with transport layer encryption, such as TCP TLS SSH version 1 or 2 or another secure transport layer protocol. As another example, the service control server link 1638 can encrypt at the link layer, such as using IPSEC, various possible VPN services, other forms of IP layer encryption and/or another link layer encryption technique.

[0088] As shown in Figure 9, the service controller 122 includes an access control integrity server 1654. In some embodiments, the access control integrity server 1654 collects device information on service policy, service usage, agent configuration and/or agent behavior. For example, the access control integrity server 1654 can cross check this information to identify integrity breaches in the service policy implementation and control system. In another example, the access control integrity server 1654 can initiate action when a service policy violation or a system integrity breach is suspected.

[0089] In some embodiments, the access control integrity server 1654 (and/or some other agent of service controller 122) acts on access control integrity agent 1694 reports and error conditions. Many of the access control integrity agent 1654 checks can be accomplished by the server. For example, the access control integrity agent 1654 checks include one or more of the following: service usage measure against usage range consistent with policies (e.g., usage

measure from the network and/or from the device); configuration of agents; operation of the agents; and/or dynamic agent download.

[0090] In some embodiments, the access control integrity server 1654 (and/or some other agent of service controller 122) verifies device service policy implementations by comparing various service usage measures (e.g., based on network monitored information, such as by using IPDRs or CDRs, and/or local service usage monitoring information) against expected service usage behavior given the policies that are intended to be in place. For example, device service policy implementations can include measuring total data passed, data passed in a period of time, IP addresses, data per IP address, and/or other measures such as location, downloads, email accessed, URLs, and comparing such measures expected service usage behavior given the policies that are intended to be in place.

[0091] In some embodiments, the access control integrity server 1654 (and/or some other agent of service controller 122) verifies device service policy, and the verification error conditions that can indicate a mismatch in service measure and service policy include one or more of the following: unauthorized network access (e.g., access beyond ambient service policy limits); unauthorized network speed (e.g., average speed beyond service policy limit); network data amount does not match policy limit (e.g., device not stop at limit without re-up/revising service policy); unauthorized network address; unauthorized service usage (e.g., VOIP, email, and/or web browsing); unauthorized application usage (e.g., email, VOIP, email, and/or web); service usage rate too high for plan, and policy controller not controlling/throttling it down; and/or any other mismatch in service measure and service policy. Accordingly, in some embodiments, the access control integrity server 1654 (and/or some other agent of service controller 122) provides a policy/service control integrity service to continually (e.g., periodically and/or based on trigger events) verify that the service control of the device has not been compromised and/or is not behaving out of policy.

[0092] As shown in Figure 9, service controller 122 includes a service history server 1650. In some embodiments, the service history server 1650 collects and records service usage or service activity reports from the Access Network AAA Server 1621 and the Service Monitor Agent 1696. For example, although service usage history from the network elements can in

certain embodiments be less detailed than service history from the device, the service history from the network can provide a valuable source for verification of device service policy implementation, because, for example, it is extremely difficult for a device error or compromise event on the device to compromise the network based equipment and software. For example, service history reports from the device can include various service tracking information, as similarly described above. In some embodiments, the service history server 1650 provides the service history on request to other servers and/or one or more agents. In some embodiments, the service history server 1650 provides the service usage history to the device service history 1618. In some embodiments, for purposes of facilitating the activation tracking service functions (described below), the service history server 1650 maintains a history of which networks the device has connected to. For example, this network activity summary can include a summary of the networks accessed, activity versus time per connection, and/or traffic versus time per connection. As another example, this activity summary can further be analyzed or reported to estimate the type of service plan associated with the traffic activity for the purpose of bill sharing reconciliation.

[0093] As shown in Figure 9, service controller 122 includes a policy management server 1652. In some embodiments, the policy management server 1652 transmits policies to the service processor 115 via the service control link 1653. In some embodiments, the policy management server 1652 manages policy settings on the device (e.g., various policy settings as described herein with respect to various embodiments) in accordance with a device service profile. In some embodiments, the policy management server 1652 sets instantaneous policies on policy implementation agents (e.g., policy implementation agent 1690). For example, the policy management server 1652 can issue policy settings, monitor service usage and, if necessary, modify policy settings. For example, in the case of a user who prefers for the network to manage their service usage costs, or in the case of any adaptive policy management needs, the policy management server 1652 can maintain a relatively high frequency of communication with the device to collect traffic and/or service measures and issue new policy settings. In this example, device monitored service measures and any user service policy preference changes are reported, periodically and/or based on various triggers/events/requests, to the policy management server 1652. In this example, user privacy settings generally require secure communication with the network (e.g., a secure service control link 1653), such as with the policy management server

1652, to ensure that various aspects of user privacy are properly maintained during such configuration requests/policy settings transmitted over the network. For example, information can be compartmentalized to service policy management and not communicated to other databases used for CRM for maintaining user privacy.

[0094] In some embodiments, the policy management server 1652 provides adaptive policy management on the device. For example, the policy management server 1652 can issue policy settings and objectives and rely on the device based policy management (e.g., service processor 115) for some or all of the policy adaptation. This approach can require less interaction with the device thereby reducing network chatter on service control link 1653 for purposes of device policy management (e.g., network chatter is reduced relative to various server/network based policy management approaches described above). This approach can also provide robust user privacy embodiments by allowing the user to configure the device policy for user privacy preferences/settings so that, for example, sensitive information (e.g., geo-location data, website history) is not communicated to the network without the user's approval. In some embodiments, the policy management server 1652 adjusts service policy based on time of day. In some embodiments, the policy management server 1652 receives, requests or otherwise obtains a measure of network availability and adjusts traffic shaping policy and/or other policy settings based on available network capacity.

[0095] As shown in Figure 9, service controller 122 includes a network traffic analysis server 1656. In some embodiments, the network traffic analysis server 1656 collects/receives service usage history for devices and/or groups of devices and analyzes the service usage. In some embodiments, the network traffic analysis server 1656 presents service usage statistics in various formats to identify improvements in network service quality and/or service profitability. In other embodiments, the network traffic analysis server 1656 estimates the service quality and/or service usage for the network under variable settings on potential service policy. In other embodiments, the network traffic analysis server 1656 identifies actual or potential service behaviors by one or more devices that are causing problems for overall network service quality or service cost.

[0096] As shown in Figure 9, service controller 122 includes a beta test server 1658. In some embodiments, the beta test server 1658 publishes candidate service plan policy settings to one or more devices. In some embodiments, the beta test server 1658 provides summary reports of network service usage or user feedback information for one or more candidate service plan policy settings. In some embodiments, the beta test server 1658 provides a mechanism to compare the beta test results for different candidate service plan policy settings or select the optimum candidates for further policy settings optimization.

[0097] As shown in Figure 9, service controller 122 includes a service download control server 1660. In some embodiments, the service download control server 1660 provides a download function to install and/or update service software elements (e.g., the service processor 115 and/or agents/components of the service processor 115) on the device, as described herein.

[0098] As shown in Figure 9 service controller 122 includes a billing event server 1662. In some embodiments, the billing event server 1662 collects billing events, provides service plan information to the service processor 115, provides service usage updates to the service processor 115, serves as interface between device and central billing server 1619, and/or provides trusted third party function for certain ecommerce billing transactions.

[0099] As shown in Figure 9, the Access Network AAA server 1621 is in network communication with the access network 1610. In some embodiments, the Access Network AAA server 1621 provides the necessary access network AAA services (e.g., access control and authorization functions for the device access layer) to allow the devices onto the central provider access network and the service provider network. In some embodiments, another layer of access control is required for the device to gain access to other networks, such as the Internet, a corporate network and/or a machine to machine network. This additional layer of access control can be implemented, for example, by the service processor 115 on the device. In some embodiments, the Access Network AAA server 1621 also provides the ability to suspend service for a device and resume service for a device based on communications received from the service controller 122. In some embodiments, the Access Network AAA server 1621 also provides the ability to direct routing for device traffic to a quarantine network or to restrict or limit network access when a device quarantine condition is invoked. In some embodiments, the Access

Network AAA server 1621 also records and reports device network service usage (e.g., device network service usage can be reported to device service history 1618).

[00100] As shown in Figure 9, the device service history 1618 is in network communication with the access network 1610. In some embodiments, the device service history 1618 provides service usage data records used for various purposes in various embodiments. In some embodiments, the device service history 1618 is used to assist in verifying service policy implementation. In some embodiments, the device service history 1618 is used to verify service monitoring. In some embodiments, the device service history 1618 is used to verify billing records and/or billing policy implementation. In some embodiments, the device service history 1618 is used to synchronize and/or verify the local service usage counter.

[00101] As shown in Figure 9, the central provider billing server 1619 is in network communication with the access network 1610. In some embodiments, the central provider billing server 1619 provides a mediation function for central provider billing events. For example, the central provider billing server 1619 can accept service plan changes. In some embodiments, the central provider billing server 1619 provides updates on device service usage, service plan limits and/or service policies. In some embodiments, the central provider billing server 1619 collects billing events, formulates bills, bills service users, provides certain billing event data and service plan information to the service controller 122 and/or device 100.

[00102] As shown in Figure 9, in some embodiments, modem selection and control 1811 selects the access network connection and is in communication with the modem firewall 1655, and modem drivers 1831, 1815, 1814, 1813, 1812 convert data traffic into modem bus traffic for one or more modems and are in communication with the modem selection and control 1811. In some embodiments, different profiles are selected based on the selected network connection (e.g., different service profiles/policies for WWAN, WLAN, WPAN, Ethernet and/or DSL network connections), which is also referred to herein as multimode profile setting. For example, service profile settings can be based on the actual access network (e.g., home DSL/cable or work network) behind the Wi-Fi not the fact that it is Wi-Fi (or any other network, such as DSL/cable, satellite, or T-1), which is viewed as different than accessing a Wi-Fi network at the coffee shop. For example, in a Wi-Fi hotspot situation in which there are a

significant number of users on a DSL or T-1 backhaul, the service controller can sit in a service provider cloud or an MVNO cloud, the service controls can be provided by a VSP capability offered by the service provider or the service controller can be owned by the hotspot service provider that uses the service controller on their own without any association with an access network service provider. For example, the service processors can be controlled by the service controller to divide up the available bandwidth at the hotspot according to QoS or user sharing rules (e.g., with some users having higher differentiated priority (potentially for higher service payments) than other users). As another example, ambient services (as similarly described herein) can be provided for the hotspot for verified service processors.

[00103] In some embodiments, the service processor 115 and service controller 122 are capable of assigning multiple service profiles associated with multiple service plans that the user chooses individually or in combination as a package. For example, a device 100 starts with ambient services that include free transaction services wherein the user pays for transactions or events rather than the basic service (e.g., a news service, eReader, PND service, pay as you go session Internet) in which each service is supported with a bill by account capability to correctly account for any subsidized partner billing to provide the transaction services (e.g., Barnes and Noble may pay for the eReader service and offer a revenue share to the service provider for any book or magazine transactions purchased from the device 100). In some embodiments, the bill by account service can also track the transactions and, in some embodiments, advertisements for the purpose of revenue sharing, all using the service monitoring capabilities disclosed herein. After initiating services with the free ambient service discussed above, the user may later choose a post-pay monthly Internet, email and SMS service. In this case, the service controller 122 would obtain from the billing system 123 in the case of network based billing (or in some embodiments, the service controller 122 billing event server 1622 in the case of device based billing) the billing plan code for the new Internet, email and SMS service. In some embodiments, this code is cross referenced in a database (e.g., the policy management server 1652) to find the appropriate service profile for the new service in combination with the initial ambient service. The new superset service profile is then applied so that the user maintains free access to the ambient services, and the billing partners continue to subsidize those services, the user also gets access to Internet services and may choose the service control profile (e.g., from one of the embodiments disclosed herein). The superset profile is the profile that provides the

combined capabilities of two or more service profiles when the profiles are applied to the same device 100 service processor. In some embodiments, the device 100 (service processor 115) can determine the superset profile rather than the service controller 122 when more than one "stackable" service is selected by the user or otherwise applied to the device. The flexibility of the service processor 115 and service controller 122 embodiments described herein allow for a large variety of service profiles to be defined and applied individually or as a superset to achieve the desired device 100 service features.

[00104] As shown in Figure 9, an agent communication bus 1630 represents a functional description for providing communication for the various service processor 115 agents and functions. In some embodiments, as represented in the functional diagram illustrated in Figure 9, the architecture of the bus is generally multipoint to multipoint so that any agent can communicate with any other agent, the service controller or in some cases other components of the device, such user interface 1697 and/or modem components. As described below, the architecture can also be point to point for certain agents or communication transactions, or point to multipoint within the agent framework so that all agent communication can be concentrated, or secured, or controlled, or restricted, or logged or reported. In some embodiments, the agent communication bus is secured, signed, encrypted, hidden, partitioned and/or otherwise protected from unauthorized monitoring or usage. In some embodiments, an application interface agent (not shown) is used to literally tag or virtually tag application layer traffic so that the policy implementation agent(s) 1690 has the necessary information to implement selected traffic shaping solutions. In some embodiments, an application interface agent (not shown) is in communication with various applications, including a TCP application 1604, an IP application 1605, and a voice application 1602.

[00105] In some embodiments, device assisted services (DAS) techniques for providing an activity map for classifying or categorizing service usage activities to associate various monitored activities (e.g., by URL, by network domain, by website, by network traffic type, by application or application type, and/or any other service usage activity categorization/classification) with associated IP addresses are provided. In some embodiments, a policy control agent (not shown), service monitor agent 1696, or another agent or function (or combinations thereof) of the service processor 115 provides a DAS activity map. In some

embodiments, a policy control agent, service monitor agent, or another agent or function (or combinations thereof) of the service processor provides an activity map for classifying or categorizing service usage activities to associate various monitored activities (e.g., by Uniform Resource Locator (URL), by network domain, by website, by network traffic type, by application or application type, and/or any other service usage activity classification/categorization) with associated IP addresses. In some embodiments, a policy control agent, service monitor agent, or another agent or function (or combinations thereof) of the service processor determines the associated IP addresses for monitored service usage activities using various techniques to snoop the DNS request(s) (e.g., by performing such snooping techniques on the device 100 the associated IP addresses can be determined without the need for a network request for a reverse DNS lookup). In some embodiments, a policy control agent, service monitor agent, or another agent or function (or combinations thereof) of the service processor records and reports IP addresses or includes a DNS lookup function to report IP addresses or IP addresses and associated URLs for monitored service usage activities. For example, a policy control agent, service monitor agent, or another agent or function (or combinations thereof) of the service processor can determine the associated IP addresses for monitored service usage activities using various techniques to perform a DNS lookup function (e.g., using a local DNS cache on the monitored device 100). In some embodiments, one or more of these techniques are used to dynamically build and maintain a DAS activity map that maps, for example, URLs to IP addresses, applications to IP addresses, content types to IP addresses, and/or any other categorization/classification to IP addresses as applicable. In some embodiments, the DAS activity map is used for various DAS traffic control and/or throttling techniques as described herein with respect to various embodiments. In some embodiments, the DAS activity map is used to provide the user various UI related information and notification techniques related to service usage as described herein with respect to various embodiments. In some embodiments, the DAS activity map is used to provide service usage monitoring, prediction/estimation of future service usage, service usage billing (e.g., bill by account and/or any other service usage/billing categorization techniques), DAS techniques for ambient services usage monitoring, DAS techniques for generating micro-CDRs (e.g., also referred to as service usage partition, service usage recording partition, service charging bucket, device generated CDRs, such as in the case where the device and not a network component are generating the usage records, ambient

usage records, specialized service usage records, or other terms to indicate a service usage data record generated to provide a more refined or detailed breakdown of service usage for the device), and/or any of the various other DAS related techniques as described herein with respect to various embodiments.

[00106] In some embodiments, all or a portion of the service processor 115 functions disclosed herein are implemented in software. In some embodiments, all or a portion of the service processor 115 functions are implemented in hardware. In some embodiments, all or substantially all of the service processor 115 functionality (as discussed herein) is implemented and stored in software that can be performed on (e.g., executed by) various components in device 100. In some embodiments, it is advantageous to store or implement certain portions or all of service processor 115 in protected or secure memory so that other undesired programs (and/or unauthorized users) have difficulty accessing the functions or software in service processor 115. In some embodiments, service processor 115, at least in part, is implemented in and/or stored on secure non-volatile memory (e.g., non volatile memory can be secure non-volatile memory) that is not accessible without pass keys and/or other security mechanisms. In some embodiments, the ability to load at least a portion of service processor 115 software into protected non-volatile memory also requires a secure key and/or signature and/or requires that the service processor 115 software components being loaded into non-volatile memory are also securely encrypted and appropriately signed by an authority that is trusted by a secure software downloader function, such as service downloader. In some embodiments, a secure software download embodiment also uses a secure non-volatile memory. Those of ordinary skill in the art will also appreciate that all memory can be on-chip, off-chip, on-board and/or off-board.

[00107] **Figure 10** provides a table summarizing various service processer 115 functional elements in accordance with some embodiments. Many of these agents are similarly described above, and the table shown in Figure 10 is not intended to be an exhaustive summary of these agents, nor an exhaustive description of all functions that the agents perform or are described herein, but rather Figure 10 is provided as a summary aid in understanding the basic functions of each agent in accordance with some embodiments, and how the agents interact with one another, with the service controller server elements, and/or with other network functions in certain embodiments to form a reliable device based service delivery solution and/or platform.

[00108] **Figure 11** provides a table summarizing various service controller 122 functional elements in accordance with some embodiments. Many of these agents/elements are similarly described above, and the table shown in Figure 11 is not intended to be an exhaustive summary of these server elements, nor an exhaustive description of all functions that the elements perform or are described herein, but rather Figure 11 is provided as a summary aid in understanding the basic functions of each element in accordance with some embodiments, and how the elements interact with one another, certain network elements, and/or the service processor agents in certain embodiments to form a reliable device based service delivery solution and/or platform.

[00109] **Figure 12** illustrates a device stack providing various service usage measurement from various points in the networking stack for a service monitor agent, a billing agent, and an access control integrity agent to assist in verifying the service usage measures and billing reports in accordance with some embodiments. As shown in Figure 12, several service agents take part in data path operations to achieve various data path improvements, and, for example, several other service agents can manage the policy settings for the data path service, implement billing for the data path service, manage one or more modem selection and settings for access network connection, interface with the user and/or provide service policy implementation verification. Additionally, in some embodiments, several agents perform functions to assist in verifying that the service control or monitoring policies intended to be in place are properly implemented, the service control or monitoring policies are being properly adhered to, that the service processor or one or more service agents are operating properly, to prevent unintended errors in policy implementation or control, and/or to prevent tampering with the service policies or control. As shown, the service measurement points labeled I through VI represent various service measurement points for service monitor agent 1696 and/or other agents to perform various service monitoring activities. Each of these measurement points can have a useful purpose in various embodiments described herein. For example, each of the traffic measurement points that is employed in a given design can be used by a monitoring agent to track application layer traffic through the communication stack to assist policy implementation functions, such as the policy implementation agent 1690, or in some embodiments, the modem firewall agent 1655 or the application interface agent, in making a determination regarding the traffic parameters or type once the traffic is farther down in the communication stack where it is sometimes difficult or impossible to make a complete determination of traffic parameters. The particular locations for

the measurement points provided in these figures are intended as instructional examples, and other measurement points can be used for different embodiments, as will be apparent to one of ordinary skill in the art in view of the embodiments described herein. Generally, in some embodiments, one or more measurement points within the device can be used to assist in service control verification and/or device or service troubleshooting.

[00110] In some embodiments, the service monitor agent and/or other agents implement virtual traffic tagging by tracking or tracing packet flows through the various communication stack formatting, processing and encryption steps, and providing the virtual tag information to the various agents that monitor, control, shape, throttle or otherwise observe, manipulate or modify the traffic. This tagging approach is referred to herein as virtual tagging, because there is not a literal data flow, traffic flow or packet tag that is attached to flows or packets, and the book-keeping to tag the packet is done through tracking or tracing the flow or packet through the stack instead. In some embodiments, the application interface and/or other agents identify a traffic flow, associate it with a service usage activity and cause a literal tag to be attached to the traffic or packets associated with the activity. This tagging approach is referred to herein as literal tagging. There are various advantages with both the virtual tagging and the literal tagging approaches. For example, it can be preferable in some embodiments, to reduce the inter-agent communication required to track or trace a packet through the stack processing by assigning a literal tag so that each flow or packet has its own activity association embedded in the data. As another example, it can be preferable in some embodiments, to re-use portions of standard communication stack software or components, enhancing the verifiable traffic control or service control capabilities of the standard stack by inserting additional processing steps associated with the various service agents and monitoring points rather than re-writing the entire stack to correctly process literal tagging information, and in such cases, a virtual tagging scheme may be desired. As yet another example, some standard communication stacks provide for unused, unspecified or otherwise available bit fields in a packet frame or flow, and these unused, unspecified or otherwise available bit fields can be used to literally tag traffic without the need to re-write all of the standard communication stack software, with only the portions of the stack that are added to enhance the verifiable traffic control or service control capabilities of the standard stack needing to decode and use the literal tagging information encapsulated in the available bit fields. In the case of literal tagging, in some embodiments, the tags are removed prior to passing

the packets or flows to the network or to the applications utilizing the stack. In some embodiments, the manner in which the virtual or literal tagging is implemented can be developed into a communication standard specification so that various device or service product developers can independently develop the communication stack and/or service processor hardware and/or software in a manner that is compatible with the service controller specifications and the products of other device or service product developers.

[00111] It will be appreciated that although the implementation/use of any or all of the measurement points illustrated in Figure 12 is not required to have an effective implementation, such as was similarly shown with respect to various embodiments described herein, various embodiments can benefit from these and/or similar measurement points. It will also be appreciated that the exact measurement points can be moved to different locations in the traffic processing stack, just as the various embodiments described herein can have the agents affecting policy implementation moved to different points in the traffic processing stack while still maintaining effective operation. In some embodiments, one or more measurement points are provided deeper in the modem stack where, for example, it is more difficult to circumvent and can be more difficult to access for tampering purposes if the modem is designed with the proper software and/or hardware security to protect the integrity of the modem stack and measurement point(s).

[00112] Referring to Figure 12, describing the device communications stack from the bottom to the top of the stack as shown, the device communications stack provides a communication layer for each of the modems of the device at the bottom of the device communications stack. Example measurement point VI resides within or just above the modem driver layer. For example, the modem driver performs modem bus communications, data protocol translations, modem control and configuration to interface the networking stack traffic to the modem. As shown, measurement point VI is common to all modem drivers and modems, and it is advantageous for certain embodiments to differentiate the traffic or service activity taking place through one modem from that of one or more of the other modems. In some embodiments, measurement point VI, or another measurement point, is located over, within or below one or more of the individual modem drivers. The respective modem buses for each modem reside between example measurement points V and VI. In the next higher layer, a

modem selection & control layer for multimode device based communication is provided. In some embodiments, this layer is controlled by a network decision policy that selects the most desirable network modem for some or all of the data traffic, and when the most desirable network is not available the policy reverts to the next most desirable network until a connection is established provided that one of the networks is available. In some embodiments, certain network traffic, such as verification, control, redundant or secure traffic, is routed to one of the networks even when some or all of the data traffic is routed to another network. This dual routing capability provides for a variety of enhanced security, enhanced reliability or enhanced manageability devices, services or applications. In the next higher layer, a modem firewall is provided. For example, the modem firewall provides for traditional firewall functions, but unlike traditional firewalls, in order to rely on the firewall for verifiable service usage control, such as access control and security protection from unwanted networking traffic or applications, the various service verification techniques and agents described herein are added to the firewall function to verify compliance with service policy and prevent tampering of the service controls. In some embodiments, the modem firewall is implemented farther up the stack, possibly in combination with other layers as indicated in other Figures. In some embodiments, a dedicated firewall function or layer is provided that is independent of the other processing layers, such as the policy implementation layer, the packet forwarding layer and/or the application layer. In some embodiments, the modem firewall is implemented farther down the stack, such as within the modem drivers, below the modem drivers, or in the modem itself. Example measurement point IV resides between the modem firewall layer and an IP queuing and routing layer. As shown, an IP queuing and routing layer is separate from the policy implementation layer where the policy implementation agent implements a portion of the traffic control and/or service usage control policies. As described herein, in some embodiments, these functions are separated so that a standard network stack function can be used for IP queuing and routing, and the modifications necessary to implement the policy implementation agent functions can be provided in a new layer inserted into the standard stack. In some embodiments, the IP queuing and routing layer is combined with the traffic or service usage control layer. For example, a combined routing and policy implementation layer embodiment can also be used with the other embodiments, such as shown in Figure 12. Measurement point III resides between the IP queuing and routing layer and a policy implementation agent layer. Measurement point II

resides between the policy implementation agent layer and the transport layer, including TCP, UDP, and other IP as shown. The session layer resides above the transport layer, which is shown as a socket assignment and session management (e.g., basic TCP setup, TLS/SSL) layer. The network services API (e.g., HTTP, HTTPS, FTP (File Transfer Protocol), SMTP (Simple Mail Transfer Protocol), POP3, DNS) resides above the session layer. Measurement point I resides between the network services API layer and an application layer, shown as application service interface agent in the device communications stack of Figure 12.

[00113] As shown in Figure 12, the application service interface layer is above the standard networking stack API and, in some embodiments, its function is to monitor and in some cases intercept and process the traffic between the applications and the standard networking stack API. In some embodiments, the application service interface layer identifies application traffic flows before the application traffic flows are more difficult or practically impossible to identify farther down in the stack. In some embodiments, the application service interface layer in this way assists application layer tagging in both the virtual and literal tagging cases. In the case of upstream traffic, the application layer tagging is straight forward, because the traffic originates at the application layer. In some downstream embodiments, where the traffic or service activity classification relies on traffic attributes that are readily obtainable, such as source address or URL, application socket address, IP destination address, time of day or any other readily obtained parameter, the traffic type can be identified and tagged for processing by the firewall agent or another agent as it initially arrives. In other embodiments, as described herein, in the downstream case, the solution is generally more sophisticated when a traffic parameter that is needed to classify the manner in which the traffic flow is to be controlled or throttled is not readily available at the lower levels of the stack, such as association with an aspect of an application, type of content, something contained within TLS, IPSEC or other secure format, or other information associated with the traffic. Accordingly, in some embodiments, the networking stack identifies the traffic flow before it is fully characterized, categorized or associated with a service activity, and then passes the traffic through to the application interface layer where the final classification is completed. In such embodiments, the application interface layer then communicates the traffic flow ID with the proper classification so that after an initial short traffic burst or time period the policy implementation agents can properly control the traffic. In some embodiments, there is also a policy for tagging and setting service control

policies for traffic that cannot be fully identified with all sources of tagging including application layer tagging.

[00114] As shown in Figure 12, a service monitor agent, which is also in communication with the agent communication bus 1630, communicates with various layers of the device communications stack. For example, the service monitor agent, performs monitoring at each of measurement points I through VI, receiving information including application information, service usage and other service related information, and assignment information. An access control integrity agent is in communication with the service monitor agent via the agent communications bus 1630, as also shown.

[00115] **Figure 13** illustrates an embodiment similar to Figure 12 in which some of the service processor is implemented on the modem and some of the service processor is implemented on the device application processor in accordance with some embodiments. In some embodiments, a portion of the service processor is implemented on the modem (e.g., on modem module hardware or modem chipset) and a portion of the service processor is implemented on the device application processor subsystem. It will be apparent to one of ordinary skill in the art that variations of the embodiment depicted in Figure 13 are possible where more or less of the service processor functionality is moved onto the modem subsystem or onto the device application processor subsystem. For example, such embodiments similar to that depicted in Figure 13 can be motivated by the advantages of including some or all of the service processor network communication stack processing and/or some or all of the other service agent functions on the modem subsystem (e.g., and such an approach can be applied to one or more modems). For example, the service processor can be distributed as a standard feature set contained in a modem chipset hardware of software package or modem module hardware or software package, and such a configuration can provide for easier adoption or development by device OEMs, a higher level of differentiation for the chipset or modem module manufacturer, higher levels of performance or service usage control implementation integrity or security, specification or interoperability standardization, and/or other benefits.

[00116] Referring to Figure 13, describing the device communications stack from the bottom to the top of the stack as shown, the device communications stack provides a

communication layer for modem MAC/PHY layer at the bottom of the device communications stack. Measurement point IV resides above the modem MAC/PHY layer. The modem firewall layer resides between measurement points IV and III. In the next higher layer, the policy implementation agent is provided, in which the policy implementation agent is implemented on the modem (e.g., on modem hardware). Measurement point II resides between the policy implementation agent and the modem driver layer, which is then shown below a modem bus layer. The next higher layer is shown as the IP queuing and routing layer, followed by the transport layer, including TCP, UDP, and other IP as shown. The session layer resides above the transport layer, which is shown as a socket assignment and session management (e.g., basic TCP setup, TLS/SSL) layer. The network services API (e.g., HTTP, HTTPS, FTP (File Transfer Protocol), SMTP (Simple Mail Transfer Protocol), POP3, DNS) resides above the session layer. Measurement point I resides between the network services API layer and an application layer, shown as application service interface agent in the device communications stack of Figure 13.

[00117] **Figure 14** illustrates various embodiments of intermediate networking devices that include a service processor for the purpose of verifiable service usage measurement, reporting, and billing reports in accordance with some embodiments. For example, Figures 14(A) through 14(E) illustrate various extended modem alternatives for access network connection through an intermediate modem or networking device combination that has a connection (e.g., LAN connection) to one or more devices 100.

[00118] In some embodiments, device 100 includes a 3G and/or 4G network access connection in combination with the Wi-Fi LAN connection to the device 100. For example, the intermediate device or networking device combination can be a device that simply translates the Wi-Fi data to the WWAN access network without implementing any portion of the service processor 115 as shown in Figure 14(A). In some embodiments, an intermediate device or networking device combination includes a more sophisticated implementation including a networking stack and some embodiments, a processor, as is the case for example if the intermediate networking device or networking device combination includes a router function, in which case the service processor 115 can be implemented in part or entirely on the intermediate modem or networking device combination. The intermediate modem or networking device combination can also be a multi-user device in which more than one user is gaining access to the

3G or 4G access network via the Wi-Fi LAN connection. In the case of such a multi-user network, the access network connection can include several managed service links using multiple instantiations of service processor 115, each instantiation, for example, being implemented in whole or in part on device 100 with the intermediate modem or networking device combination only providing the translation services from the Wi-Fi LAN to the WWAN access network.

[00119] Referring now to Figures 14(B)-(D), in some embodiments, the service processors 115 are implemented in part or in whole on the intermediate modem or networking device combination. In the case where the service processor 115 is implemented in part or in whole on the intermediate modem or networking device combination, the service processor 115 can be implemented for each device or each user in the network so that there are multiple managed service provider accounts all gaining access through the same intermediate modem or networking device combination. In some embodiments, the functions of service processor 115 are implemented on an aggregate account that includes the WWAN access network traffic for all of the users or devices connected to the Wi-Fi LAN serviced by the intermediate modem or networking device combination. In some embodiments, the central provider can also provide an aggregated account service plan, such as a family plan, a corporate user group plan and/or an instant hotspot plan. In the case where there is one account for the intermediate modem or networking device combination, the intermediate modem or networking device combination can implement a local division of services to one or more devices 100 or users in which the services are controlled or managed by the intermediate modem or networking device combination or the device 100, but the management is not subject to service provider control and is auxiliary to the service management or service policy implementation performed by service processors 115. In some embodiments, another service model can also be supported in which there is an aggregate service provider plan associated with one intermediate modem or networking device combination, or a group of intermediate modems or networking device combinations but where each user or device still has its own service plan that is a sub-plan under the aggregate plan so that each user or device has independent service policy implementation with a unique instantiation of service processor 115 rather than aggregate service policy implementation across multiple users in the group with a single instantiation of service processor 115.

[00120] As shown in Figure 14(B), in some embodiments, device 100 includes a Wi-Fi modem, a Wi-Fi modem combined with a 3G and/or 4G WWAN modem on intermediate modem or networking device combination 1510, and the intermediate modem or networking device combination forwards WWAN access network traffic to and from device 100 via the Wi-Fi link. For example, the service processor 115 can be implemented in its entirety on device 100 and the service provider account can be associated exclusively with one device. Similarly, as shown in Figure 14(C), such an implementation can be provided using a different access modem and access network, such as a 2G and/or 3G WWAN, DSL wire line, cable DOCSIS wire line or fiber wire line configuration in place of the 3G and/or 4G access network connection to the intermediate modem or networking device combination 1510. In addition, various other embodiments similarly use DSL as shown in Figures 14(D), USB, Ethernet, Bluetooth, or another LAN or point to point connection from device 100 to the intermediate modem or networking device combination 1510, or a femto cell modem and DSL/cable/T1/other combination as shown in Figure 14(E).

[00121] **Figure 15** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including a proxy server(s) 270 in accordance with some embodiments. As shown, Figure 2 includes a proxy server(s) 270 in communication with a 4G/3G/2G wireless network operated by, for example, a central provider. For example, the proxy server(s) 270 can be used to implement and/or assist in providing various techniques described herein, such as service usage measurement and/or other techniques as described herein.

[00122] **Figure 16** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including a service provider network in accordance with some embodiments, involving one or more of service controllers, service processors and/or proxy server/routers. This diagram illustrates the connections and flows for the provisioning system, new subscriber activation system and order system with the equipment functions having similar or identical embodiments as described in the context of Figure 4 except in this case one or more proxy server/routers 270 are included for embodiments as described herein.

[00123] While the specific illustrations in Figures 16 through 18 and associated descriptions refer to a the wireless 3G/4G network, it will be apparent to one of ordinary skill in the art that these techniques can similarly be applied to other types of access networks including, for example, WiFi, cable, DSL, fiber, satellite, and/or other networks. It will also now be apparent to one of ordinary skill in the art that in the context of the proxy server/router embodiments illustrated in Figures 16 through 18 that many other embodiments are possible for the CDR (or FDR, start/stop records, interim accounting records, IPDRs, micro-CDR or service charging bucket accounting) recording, reporting, aggregating, mediating and/or synchronizing usage records within the various network elements and/or device elements.

[00124] **Figure 17** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including a service provider network in accordance with some embodiments, involving one or more of service controllers, service processors and/or proxy server/routers. This diagram illustrates the connections and flows for the charging system with the equipment functions having similar or identical embodiments as described in the context of Figures 4 through 8 except in this case one or more proxy server/routers 270 are included for embodiments as described herein. The charging flows are illustrated by three line types: solid lines for device generated CDRs and proxy server/router generated CDRs, dashed lines for network equipment generated CDRs, and double dot-dash line types for CDRs that have been mediated by a service controller 120 and/or mediation system 118.

[00125] **Figure 18** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including a service provider network in accordance with some embodiments, involving one or more of service controllers and/or proxy server/routers. This diagram illustrates the connections and flows for the charging system with the equipment functions having similar or identical embodiments as described in the context of Figure 17 except in this case there is no service processor CDR feed and only CDR feeds from the network equipment and the proxy server/routers. The charging flows are illustrated by three line types: solid lines for proxy server/router generated CDRs, dashed lines for network equipment generated CDRs, and double dot-dash line types for CDRs that have been mediated by a service controller 120 and/or mediation system 118.

[00126] In some embodiments, the proxy server is used for one or more of the functions of: generating, collecting, aggregating, mediating and/or reporting service usage charging information. In some embodiments, the proxy server/router is used for one or more of collecting, aggregating, mediating and/or reporting service usage charging information in which a client device service processor assists in routing traffic to and/or from the proxy server. In some embodiments, the proxy server is used for one or more of the functions of: generating, collecting, aggregating, mediating and/or reporting service usage charging information and the policies controlling the device service processor and the proxy servers are coordinated and distributed by a service controller. In some embodiments, the proxy server/router is used for one or more of: collecting, aggregating, mediating and/or reporting service usage charging information where a client device service processor assists in routing traffic to and/or from the proxy servers and the service processors are coordinated and distributed by a service controller. In some embodiments, in which the proxy server is used in conjunction with a device service processor (e.g., or other client function), the service processor detects one or more types of ambient service activity or other special service activity and routes the traffic to the appropriate proxy server destination for that activity.

[00127] In some embodiments, one or more proxy servers or routers are used for one or more of: generating, collecting, aggregating, mediating and/or reporting service usage charging information in which the proxy server communicates with a client device UI for the purpose of informing the user of service status and/or receiving user feedback on service status.

[00128] In some embodiments, one or more proxy servers or routers are used for controlling service usage in accordance with a set of policies for specialized services that are programmed by a service design UI (VSP Interface 4910). In some embodiments, one or more proxy servers or routers are used for controlling service usage in accordance with a set of policies for specialized services that are programmed by a network element with a service design UI, and the policies controlling the device service processor and the proxy server are coordinated and distributed by a service controller.

[00129] In some embodiments, one or more proxy servers or routers are used for one or more of generating, collecting, aggregating, mediating and/or reporting service usage charging

information in which a client device service processor assists in routing traffic to and/or from the proxy server and the policies controlling the device service processor and the proxy server are coordinated and distributed by a service controller.

[00130] In some embodiments, the proxy servers can be distributed and managed across diverse geographical separations so that the device traffic to the proxy server/routers does not need to traverse long distances before being connected through the proxy server/routers to the Internet, data, or phone network 120. For example, this geographic diversity or redundancy can be accomplished in a number of ways including using a redundant server or router architecture with a load balancer to determine the best hop to the nearest equipment location, coupled with a distributed data base to persist the device service state so that if a proxy server/router element goes down the device service may be effectively resumed by a different proxy server/router in the same data center or in a geographically diverse data center. In some embodiments, the device service state is persisted in this way by a distributed or redundant diversity data base. In some embodiments, the device service state is held by the service controller network, which in some embodiments, are also distributed and/or redundant. In some embodiments, the device service state is persisted by other network equipment elements. In some embodiments, the device service state is persisted by the device client software (e.g., service processor).

[00131] In some embodiments, it may not be possible to accurately identify every network service access attempt or service usage (e.g., or traffic access) as belonging to a given service usage partition (e.g., a given ambient service usage, background network chatter usage, user service plan usage, emergency service usage, and/or other type of service usage). As used herein, the terms service usage partition, service usage recording partition, service charging bucket, and micro-CDRs are used interchangeably. Accordingly, it is desirable to provide a service charging bucket for traffic that is allowed and not definitively identified as belonging to a known service charging bucket. This allows for techniques to employ an "allow but verify" approach to traffic that is likely to be legitimately associated with an ambient service or a user service or a network service that is intended to be allowed, but is not definitively identified as being associated with an allowed service.

[00132] As an example, there may be a web site access associated with an ambient service that does not have a reference identifier or other traffic parameter that allows the service processor to associate it with the correct ambient service. In this case, a set of rules can be applied to determine if it is likely that the web site access is a legitimate access given the access control policies that are in place, and if it is the access can be allowed and the traffic usage either recorded in the ambient service charging bucket that it is suspected to be associated with, or the traffic usage can be charged to a network chatter service usage bucket, or the traffic usage can be charged to the user service usage bucket, or the traffic usage may be recorded in a "not classified but allowed" service charging bucket. In some embodiments, in which such traffic is charged to the "not classified but allowed" service usage charging bucket, additional verification measures are employed to ensure that the amount of traffic that is not classified but allowed does not grow too large or become a back-door for service usage errors. For example, the access control policy rules for allowing unclassified traffic can be relatively loose as long as the amount of service usage charges accumulating in the not classified charging bucket remains within certain bounds, and/or the rate of service usage charged to the not classified bucket remains within certain bounds, but if the not classified traffic becomes large or the rate of not classified traffic growth becomes large then the rules governing when to allow not classified traffic can be tightened.

[00133] As another example, a browser application can access a web site that is known to be an ambient service website, and that web site might serve back a series of traffic flows, some of which are associated with the ambient service website through URL identifiers that are known to be part of the website, and other traffic can be associated with the ambient service website by virtue of a referring website tag or header, and some traffic can be returned to the same application with a relatively close time proximity to the other traffic as being identified as ambient traffic. In this example, as long as the not classified traffic service charging bucket does not exceed a given pre-set policy limit on its size, and/or does not grow faster than a given pre-set policy rate, and/or is received within a certain pre-set policy period of time difference from the time that other ambient service charging bucket traffic is received, then the not classified traffic is continued to be allowed. However, if the not classified traffic amount or rate of growth exceeds the pre-set policy limits, or if the period of time between when verified ambient service traffic is received and the not classified traffic is received exceeds policy limits, then the not

classified traffic can be blocked or other action can be taken to further analyze the not classified traffic.

[00134] In some embodiments, it is important to provide a hierarchy of service usage charging rules for the various service usage partitions on a device. As an example, for a given service plan there can be two ambient service charging buckets, a network chatter (e.g., or network overhead) service charging bucket, and a user service plan service charging bucket and it is desirable to make sure that no ambient services or network overhead service or unclassified service is charged to the user service plan, and it is also desirable to ensure that all known ambient service traffic is charged to the appropriate ambient service partner, and it is desirable to ensure that no network overhead service or unclassified service is charged to ambient service partners. In such situations, a service charging bucket hierarchy can be provided as follows: determine if a traffic flow (e.g., or socket) is associated with network overhead, and if so allow it and charge that service bucket, then determine if a traffic flow (or socket) is associated with ambient service #1, and if so allow it and charge that service bucket, then determine if a traffic flow (or socket) is associated with ambient service #2, and if so allow it and charge that service bucket, then determine if a traffic flow (or socket) is associated with not classified traffic, and if so allow it and charge that service bucket, then if the traffic is not associated with any of the above service charging buckets allow it and charge it to the user service plan charging bucket. In another example, if the user has not yet chosen to pay for a user service plan, then the same hierarchical access control and service charging policy can be used except the final step would be: then if the traffic is not associated with any of the above service charging buckets block the traffic. Hierarchical service charging bucket identification such as depicted in these examples can be a crucial aspect of a robust access control policy and/or service charging policy system. Many other access control policy hierarchies and service charging bucket policy hierarchies will now be apparent to one of ordinary skill in the art.

[00135] In some embodiments, the not classified traffic is charged according to service charging rules that rely on the most likely candidate service charging bucket for the traffic. As another example, if the not classified traffic is being delivered to the same application as other known ambient service traffic and the time difference between delivery of the known ambient service traffic and the not classified traffic is small, then the not classified traffic can be charged

to the ambient service in accordance with a pre-set charging policy rule specifying these conditions. Other embodiments that will now be apparent to one of ordinary skill in the art. For example, another charging rule for not classified traffic could be to perform a pro-rata allocation of the not classified traffic to all of the other service charging buckets with the pro-rata allocation being based on the percentage of the total traffic used by the device for each service charging bucket. As another example, the not classified traffic can be charged to a subset of the service charging buckets for the device (e.g., all ambient services plus the network overhead service) in accordance with the pro-rata share for each service included in the pro-rata split.

[00136] In some embodiments, the user service plan agreement is structured so that the user acknowledges that ambient services in which the access connection to the service is sponsored, paid for, and/or partially subsidized by an entity other than the user are a benefit to the user, and/or the user acknowledges that there is no inherent right to free ambient services, and that the service usage accounting system may not always properly characterize usage for a sponsored or subsidized ambient service (e.g., or some other specialized service) in the correct accounting service charging bucket, and, thus, the user service plan account can be charged and/or billed with some of this traffic. By having the user acknowledge a service use agreement of this form then some ambient traffic can be charged to the user service plan account, including, for example, allowed but not classified traffic, excess ambient service usage beyond pre-set policy limits, ambient service usage during busy network periods or on congested network resources, and/or other criteria/measures. In some embodiments, the user might be notified that they are being charged for service activities that are sometimes subsidized or free to the user. As discussed above, it is important to ensure that a not classified service charging bucket does not become a back door for service charging errors or hacking. It will now be apparent to one of ordinary skill in the art that the not classified service usage charges can be verified in a variety of manners, including, for example, observing the size of the not classified service charging bucket as compared to other service usage charges on the device (e.g., total device service usage, ambient service usage, user bucket service usage, and/or other criteria/measures), capping the not classified bucket, and/or capping the rate of growth of the not classified bucket.

[00137] In some embodiments, it is important to verify not only that the total device service usage amount is correct, but that the service usage is being reported in the proper service

charging buckets. For example, if the service processor software can be hacked so that it correctly reports the total service usage, but reports user service plan traffic under one or more ambient service buckets, then simply verifying that the total amount of service usage is correct will not be sufficient to prevent the device from obtaining free user service that can be charged to ambient service partners. There are a variety of direct and indirect embodiments to accomplish this verification of service charging bucket divisions. For example, in direct verification embodiments, one or more alternative measures of service usage are employed to cross-check the accuracy of the service charging bucket divisions. In indirect embodiments one of two classes of verification are employed: the size and rate of growth for service charging buckets is analyzed and compared to a pre-set group of policies to detect and/or modify service charging bucket growth that is out of policy; and/or the proper operation of the service processor elements involved in service charging bucket partitioning is verified.

[00138] Various embodiments involving direct verification of service charging bucket usage and/or accounting include the use of network based service usage measures such as CDRs, IPDRs, flow data records (e.g., FDRs – detailed reports of service usage for each service flow, such as network socket connection, opened and used to transmit data to or from the device), accounting records, interim accounting records or other similar usage records to verify that the device is within service policy and/or the device based service usage reports are accurate. Use of such network generated service usage records to directly verify service charging and/or proper service usage policy adherence are described herein. When network address destination and/or source information is available in these records, as described herein, this can be used in some embodiments, to verify the service charging bucket accounting provided by the device service processor. In some embodiments, some types of service usage records include real-time data but not necessarily all of the useful information needed to help verify service charging bucket accounting, while other types of service usage records provide more detail (e.g., IP address for destination and source) but do not always arrive in real-time. For example, in some embodiments, FDRs are created each time a new service flow (e.g., network socket connection) is opened and then closed. At the time the service flow is closed, a (e.g., possibly time stamped) data usage record indicating source address, destination address and amount of data transmitted is created and sent to a charging aggregation function in the network. The charging aggregation function can then forward the FDRs to the service controller for verification or direct accounting

of service charging bucket accounting. By comparing the FDR addresses with known ambient service traffic address associations, the partitioning of service charging buckets between one or more ambient services and other services such as a user service plan service charging bucket may be verified. However, in some cases it can be a long period of time for an FDR to be generated when a device service flow (e.g., socket) remains open for a long period of time, as in the case for example with a long file download, a peer to peer connection with a socket keep alive, or a proxy server service with a socket keep alive. In such cases, it can be disadvantageous to have large amounts of data to be transferred without an FDR to confirm device service processor based reports, and in some cases this can provide an opportunity for service processor service reporting hacks. This can be remedied in a variety of ways by using other network reported service usage information to augment the FDR information. For example, start and stop accounting records can sometimes be obtained in some embodiments, from a network element such as a service gateway or the AAA servers (e.g., or other network equipment elements depending on the network architecture). Although start and stop records do not possess the detail of service usage information that FDRs, CDRs, IPDRs, interim accounting records or other service usage records posses, they do inform the service controller that a device is either connected to the network or has stopped connecting. If a device is connected to the network and is not transmitting device usage reports or heartbeats, then the service controller is alerted that an error or hacking condition is likely. As another example of how two or more types of network reported service usage information may be used to create a better real time or near real-time check on device service usage, if both FDRs and start/stop accounting records are available, the service controller can send a stop-then-resume service command to the device (e.g., or alternatively send a stop then resume service command to a network equipment element), which will cause the device to terminate all open service flows before re-initiating them, and once the service flows are stopped then the FDR flow records will be completed and transmitted for any service flows that were in process but unreported when the stop service command was issued. This will cause any long term open socket file transfers to be reported in the FDR flow records thus plugging the potential back door hole in the FDR service usage accounting verification method.

[00139] As another example showing how multiple types of network generated service usage accounting records may be used to complement each other and strengthen the verification

of service charging bucket accounting partitions, interim data records can be used with FDRs. Interim data records are available in accordance with some embodiments, n which the interim data records are generated on a regularly scheduled basis by a network element (e.g., gateway, base station, HLR, AAA, and/or other network element/function). Interim data records are typically near real time records that report the aggregate traffic usage for the device as of a point in time, but often do not include traffic address information or other traffic details. In embodiments in which both interim accounting records and FDRs are available, when the interim accounting records are indicating service usage that is not being reported in the FDR stream this is evidence that a device has one or more long term socket connections that are open and are not terminating. In this case, the service controller can verify that the device based usage reports are properly accounting for the total amount of service usage reported by the interim accounting records, and/or the service controller can force an FDR report for the open sockets by issuing a stop-resume service command as similarly discussed above.

[00140] As described herein, other embodiments involving direct verification of service charging bucket accounting can be provided. One example is to route ambient service traffic to a proxy server or router programmed to support only the network access allowed for the ambient service and to account for the ambient service usage. Additional proxy servers or routers can be similarly programmed for each ambient service that is part of the device service plan, and in some embodiments, another proxy server or router is programmed to support traffic control and account for the user service plan service access. By comparing the service usage accounting for each of these proxy servers or routers, the device generated service charging bucket accounting can be directly verified. In some embodiments, the usage accounting provided by the proxy servers or routers is used directly for service usage accounting.

[00141] In some embodiments, ambient service partner feedback is used to verify service charging bucket accounting. For example, web servers used by ambient service partners to provide ambient services can identify a user device based on header information embedded in the HTML traffic, and then account for either the service used by the device during the ambient service sessions or account for the number of transactions the user completes. If service usage is recorded, then it can be reported to the service controller and be used directly to verify ambient service charging bucket accounting. If transactions are all that are recorded, then this can be

reported to the service controller and the amount of ambient service used by the device can be compared with the number of transactions completed to determine if the ambient service usage is reasonable or should be throttled or blocked. It will now be apparent to one of ordinary skill in the art that other embodiments can be provided that employ more than one type of network generated service usage records to verify service usage accounting and/or verify service charging bucket accounting.

[00142] Other embodiments involving indirect methods for verifying or controlling service charging bucket accounting include monitoring the size and/or growth rate of ambient service usage. In some embodiments, the access control policy rules call for restricting a given ambient service access when the amount of service usage charges accumulating in the ambient service charging bucket exceed a pre-set policy limit, and/or when the rate of service usage for the ambient service exceeds a pre-set policy limit. For example, once these limits are reached, the ambient service can be throttled back for a period of time, blocked for a period of time, or charged to the user service plan charging bucket. In some embodiments, before these actions are taken the user UI can be used to notify the user of the service policy enforcement action. In some embodiments, indirect verification of service charging bucket accounting includes the various techniques described herein for verifying proper operation of the service processor agent software and/or protecting the service processor agent software from errors, manipulation, or hacking.

[00143] In some embodiments, the device service processor directs traffic destined for a given ambient service to a proxy server or router programmed to support that ambient service, and any traffic control policies and/or access control policies for the ambient service are implemented in the proxy server or router. For example, in such embodiments the proxy server or router can be programmed to only allow access to one or more ambient services that are authorized by the device service plan, with the proxy server or router controlling device access so that other network destinations cannot be reached. Continuing this example embodiment, the proxy server or router can account for the ambient service usage in an ambient service charging bucket as discussed elsewhere. In such proxy server or router ambient service control embodiments, the same traffic association techniques described elsewhere that allow incoming traffic associated with an ambient service website or other service to be identified, allowed or

blocked, potentially throttled, and accounted for in a service charging bucket can be implemented in the proxy server or router programming. Such proxy server or router embodiments can also implement user service plan service charging buckets, user service plan traffic controls, and user service plan access control as discussed herein. In some embodiments, the proxy server or router analyzes the HTML traffic content of the traffic flows as described herein to perform such associations, traffic control and/or service usage accounting. Similarly, in some embodiments, a proxy server or router can provide the "surf-out" capabilities described herein by performing the same surf-out traffic associations (e.g., HTML branch reference associations and/or other branch associations) described herein. It will now be apparent to one of ordinary skill in the art that many of the adaptive ambient service control and service usage charging functions described herein for a service processor can be readily implemented with a proxy server or router that is appropriately programmed.

[00144] In some embodiments, routing of device traffic for one or more ambient services and/or user service plan services to a proxy server or router is accomplished by the device service processor using the device service processor traffic control embodiments described herein. In some embodiments, routing of device traffic for one or more ambient services and/or user service plan services to a proxy server or router is accomplished by dedicated network equipment such as the gateways (e.g., SGSN, GGSN, PDSN, or PDN) , home agents, HLRs or base stations, with the network equipment being provisioned by a service controller (e.g., or other interchangeable network element with similar functions for this purpose) to direct the device traffic to the proxy server or router. In some embodiments, the ambient service traffic or the user service plan traffic is controlled by the proxy server according to a service plan policy set supplied by the service controller (e.g., or equivalent network function for this purpose). The traffic control service policy thus implemented by the proxy server can control traffic based on one or more of the following: period of time, network address, service type, content type, application type, QoS class, time of day, network busy state, bandwidth, and data usage.

[00145] In some embodiments, a proxy server or router is used to verify accounting for a given service, for example, an ambient service. In some embodiments, this is accomplished by the device service processor directing the desired service flows to a proxy server or router programmed to handle the desired service flows, with the proxy server or router being

programmed to only allow access to valid network destinations allowed by the access control policies for the desired service, and the proxy server or router also being programmed to account for the traffic usage for the desired services. In some embodiments, the proxy service usage accounting may then be used to verify device based service usage accounting reported by the service processor. In some embodiments, the accounting thus reported by the proxy server or router can be used directly to account for service usage, such as ambient service usage or user service plan service usage.

[00146] In some embodiments, in which a proxy server is used for device service usage accounting, the proxy server maintains a link to the device service notification UI via a secure communication link, such as the heartbeat device link described herein. For example, the proxy server or router can keep track of device service usage versus service plan usage caps/limits and notify the user device UI through the device communication link (e.g., heartbeat link) between the service controller and the device. In some embodiments, the proxy server/router communicates with a device UI in a variety of ways, such as follows: UI connection through a device link (e.g., heartbeat link), through a device link connected to a service controller (e.g., or other network element with similar function for this purpose), presenting a proxy web page to the device, providing a pop-up page to the device, and/or installing a special portal mini-browser on the device that communicates with the proxy server/router. In some embodiments, the UI connection to the proxy server/router is used as a user notification channel to communicate usage notification information, service plan choices, or any of the multiple services UI embodiments described herein.

[00147] In some embodiments, for the proxy server/router techniques for implementing service traffic/access controls and/or service charting bucket accounting, it is desirable to have the same information that is available to the service processor on the device, including, for example, application associated with the traffic, network busy state, QoS level, or other information about the service activity that is available at the device. For example, such information can be used to help determine traffic control rules and/or special services credit is due (e.g., ambient services credit). In some embodiments, information available on the device can be communicated to the proxy server/router and associated with traffic flows or service usage activities in a variety of ways. For example, side information can be transmitted to the

proxy server/router that associates a traffic flow or service activity flow with information available on the device but not readily available in the traffic flow or service activity flow itself. In some embodiments, such side information may be communicated over a dedicated control channel (e.g., the device control link or heartbeat link), or in a standard network connection that in some embodiments, can be secure (e.g., TLS/SSL, or a secure tunnel). In some embodiments, the side information available on the device can be communicated to the proxy server/router via embedded information in data (e.g., header and/or stuffing special fields in the communications packets). In some embodiments, the side information available on the device can be communicated to the proxy server/router by associating a given secure link or tunnel with the side information. In some embodiments, the side information is collected in a device agent or device API agent that monitors traffic flows, collects the side information for those traffic flows, and transmits the information associated with a given flow to a proxy server/router. It will now be apparent to one of ordinary skill in the art that other techniques can be used to communicate side information available on the device to a proxy server/router.

[00148] For example, just as the hierarchy of charging rules can be important for implementations in which the service processor is creating the service charging bucket accounting, it can also important in implementations that use a proxy server or router for service charging bucket accounting. Accordingly, various embodiments described herein for creating a hierarchy of service usage charging rules can be applied to proxy server or proxy router embodiments. It will be apparent to one of ordinary skill in the art that the service charging bucket embodiments and traffic control and access control embodiments described herein for allowed but not classified buckets apply equally to the proxy server/router embodiments. For example, pre-defined service policy rules can be programmed into the proxy server/router to control the traffic flows and/or place usage limits or access limits on an ambient service, or a user service plan service. It will also now be apparent to one of ordinary skill in the art that the embodiments described herein disclosing an initial allowed service access list, temporarily allowing additional service activities until they are determined to be allowed or not allowed, expanding the allowed service activity list, maintaining a not allowed service activity list and expanding the not allowed service activity list also apply equally to proxy server/router embodiments. Similarly, it will now be apparent to one of ordinary skill in the art that the proxy/server router embodiments can be employed to directly generate the service charging

bucket (or micro-CDR) usage reports used to provide further detail and/or billing capabilities for service usage. In some embodiments, in which the device service processor directs traffic to a proxy server/router, there are advantageous design feature embodiments available that can reduce the need to provision network to detect and force specialized device service traffic to the appropriate proxy server/router. For example, this can be done by creating a "usage credit" system for the services supported by the proxy server/outer. Total service usage is counted on the one hand by the device service processor, or by other network equipment, or by both. Credit on the other hand for ambient service or other specialized access service usage that is not charged to the user is then provided for services that the device directs through the proxy server/router destination (e.g., URL or route hop) supporting the particular ambient service or other specialized access service. If the device correctly directs traffic to the proxy server/router, then the counting and/or access rules are correctly implemented by the proxy server/router. The service can be thus controlled and/or accounted for. When the service is accounted for, the proxy server/router reports the service charging bucket accounting back to the service controller (e.g., or other network equipment responsible for service charging bucket/ micro CDR mediation) and the user service plan service charging bucket account can be credited for the services. Traffic that reaches the proxy server/router is controlled by the access rules and/or traffic control rules and/or QoS control rules of the proxy server/router programming, so there is no question regarding the type of service that is supported with the service charging buckets that are reported to mediation functions (e.g., mediation functions can be performed by one or more of service controller, usage mediation, billing, AAA, and/or HLR/home agent). As the proxy server/router is in the network and can be physically secured and protected from hacking, there is high confidence that the service control and/or charging rules intended for ambient services or some other specialized service are properly implemented and that the proxy server/router connection is being used for the intended service and not some other unintended hacked service. If the device is somehow hacked or otherwise in error so that the traffic is not directed through the appropriate proxy server/router, then the proxy server/router does not log the traffic in micro CDRs/buckets and no specialized service usage credit is sent to the mediation functions, so there is no usage credit deducted from the device user service plan service usage totals. Thus, the user pays for the services when the device is hacked to avoid the proxy server/router. The user

account service agreement can specify that if the user tampers with software and traffic is not routed to servers then credit will not be provided and user plan will be charged.

[00149] In some proxy server/router embodiments, the usage credit is sometimes recorded by the proxy server/router detecting which device is performing the access. Device identification can be accomplished in a variety of ways including a header/tag inserted into the traffic by the device, a route in the network specified for that device, a secure link (e.g., TLS/SSL, IP Sec, or other secure tunnel), a unique device IP address or other credential (e.g., where proxy server/router has access to an active IP address look up function), a unique proxy server/router address and/or socket for the device.

[00150] In some embodiments, the coordination of the device service controller traffic control elements with a proxy server/outer can make it simpler to locate, install, provision and operate the proxy servers. The proxy server/routers do not need to be located "in line" with the access network because it is the device's responsibility to make sure the traffic is routed to the servers/routers or else there is not credit and the user account is charged. In some embodiments, this makes it unnecessary or reduces the need to force device traffic routes in carrier network. In some embodiments, the proxy server/routers can be located in carrier network or on the Internet. If the proxy server/routers are on Internet, then traffic can be authenticated in a firewall before being passed to server/routers to enhance security to attack.

[00151] In some embodiments, the service charging bucket recording software in the proxy server/router can be programmed into an ambient service partners network equipment directly thus eliminating the need for special apparatus. The ambient service partner's equipment (e.g., a web server, load balancer or router) can recognize the device using one of the techniques described above, aggregate the device service charging bucket accounting, and periodically send the usage accounting to the service controller or other network service usage mediation function.

[00152] Programming and/or provisioning the types of ambient services, user service plan services and/or specialized services disclosed in various embodiments described herein can be a complex process. In some embodiments, a simplified central network user or MVNO user programming interface, also referred to herein as a Virtual Service Provider Work Station 4910

or interchangeably as a service design interface or VSP Interface, is used to program the necessary policy settings for such services is desirable. For example, a service design interface (VSP Interface 4910) is provided that organizes and/or categorizes the various policy settings that are required to set up an ambient service (e.g., or other service) including one or more of the following: a policy list of service activities that are allowed under the ambient service (e.g., or other service), access control policies, rules for implementing and/or adapting an allowed list of network destinations, rules for implementing and/or adapting a blocked list of network destinations, service charging bucket policies, user notification policies, service control, and/or service charging bucket verification policies, actions to be taken upon verification errors. In some embodiments, the required information for one or more of these policy sets is formatted into a UI that organizes and simplifies the programming of the policies. In some embodiments, the UI is partly graphical to help the user understand the information and what settings need to be defined in order to define the service. In some embodiments, the UI is created with an XML interface. In some embodiments, the UI is offered via a secure web connection. In some embodiments, a basic service policy for an ambient service (e.g., or another service) is created that includes one or more of the above service policy settings, and then this service policy set becomes a list or an object that can be replicated and used in multiple service plan policy set definitions (e.g., "dragged and dropped" in a graphical UI). In some embodiments, the resulting set of policies created in this service design interface (VSP Interface 4910) are then distributed to the necessary policy control elements in the network and/or on the device that act in coordination to implement the service policy set for a given device group. For example, if a service processor is used in conjunction with a service controller, then the service design (VSP Interface 4910) interface can load the service policy settings subsets that need to be programmed on the service controller and the device service processor into the service controller, and the service controller loads the service controller policy settings subset into the service controller components that control the policies and loads the device policy settings subset to the devices that belong to that device group. In embodiments in which a proxy server/router is used to help control and account for services, in some embodiments, the service design interface (VSP Interface 4910) loads the service policy settings subsets that need to be programmed on the proxy server/router into the proxy server/router. In embodiments where other network equipment (e.g., gateways, base stations, service usage recording/aggregation/feed equipment, AAA, home agent/HLR,

mediation system, and/or billing system) need to be provisioned or programmed, in some embodiments, the service design interface (VSP Interface 4910) also loads the appropriate device group policy subsets to each of the equipment elements. Accordingly, various techniques can be used as described herein to greatly simplify the complex task of translating a service policy set or service plan into all the myriad equipment and/or device settings, programming, and/or provisioning commands required to correctly implement the service. It will now be apparent to one of ordinary skill in the art that several of these techniques can similarly be used for the VSP service design interface (VSP Interface 4910). In some embodiments, a service processor is used in conjunction with one or more proxy servers or routers for one or more of QoS charging, QoS provisioning and/or QoS control. In some embodiments, one or more proxy servers or routers are used in conjunction with a service controller (e.g., or other network function with similar functions for this purpose) for one or more of QoS charging, QoS provisioning, and/or QoS control. In some embodiments, a service processor is used in conjunction with one or more proxy servers or routers and a service controller (e.g., or other network function with similar functions for this purpose) for one or more of QoS charging, QoS provisioning, and/or QoS control. In some embodiments, one or more proxy servers or routers are used in conjunction with a service controller (e.g., or other network function with similar functions for this purpose) for one or more of QoS charging, QoS provisioning, and/or QoS control, in which the proxy server or router policies for this QoS service implementation are programmed by a service design UI (VSP Interface 4910).

[00153] **Figure 19** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including two service provider networks in accordance with some embodiments. The description of the network equipment element functions is generally identical to the embodiments depicted in other figures, except that one or more service controllers 120 and/or proxy servers/routers 270 and/or service design interfaces (VSP Interface 4910) are shared between the two networks as described herein. For example, the network equipment, charging record formats, provisioning systems can be similar in the two networks, or may be completely different since in the various embodiments the service controller 120, service processor 115, and/or proxy sever router 270 are used to provide unified roaming services, or in some embodiments, to provide common network service features across the different networks.

[00154] **Figure 20** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including two service provider networks in accordance with some embodiments, involving one or more of service controllers and/or service processors. Figure 20 is similar to Figure 19 except that Figure 20 illustrates that various types of access network technology and equipment can be used on any number of the central provider networks (e.g., 2G/3G/4G cellular wireless plus WiFi is the example in Figure 19 while 2G/3G/4G cellular wireless plus DSL and cable is the example in Figure 20). Figures 19 and 20 do not show the access network connections to the central provider #2 core network, but that the second central provider network can have all of or some of the access equipment elements that the first central provider network possesses, or the second central provider network can posses different access network technology and equipment as described herein would be apparent to one of ordinary skill in the art. For example, if any aspect of the 2G/3G/4G technology is different for the two networks, then multi-mode wireless modules can be used in the device modems to allow for access connection using one technology on the first central provider network, and access connection using a second technology on the second central provider network. As many of the techniques and embodiments described herein allow for network service policy implementation at layers above the modem physical layer, modem MAC layer and the access network access control and authorization layers, then any number of multi-mode modem technologies can be employed to bridge connect to either of the two networks while enhancing roaming services or providing unified network services in one or more of the areas of service traffic control, user notification interfaces, charging policies and/or systems, QoS services, instant activation services and/or billing services. It will be apparent to one of ordinary skill in the art that while the discussion herein is for service provider (e.g., central provider, MVNO, VSP, etc) networks, many of the embodiments can similarly be applied to private networks such as, for example, enterprise networks, enterprise WAN solutions and/or remote office solutions, government networks, emergency networks, and/or networks involving intermediate networking devices.

[00155] **Figure 21** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including two service provider networks in accordance with some embodiments. For example, Figure 21 includes elements that can be identical or very similar to those described in the context of Figures 5 through 8, except that in

Figure 21 there are two central provider networks in which the CDR reporting and service controls are unified through one or more common service controllers 120 and/or service processors 115. As shown in Figure 21, the charging flows are illustrated by three line types: solid lines for device generated CDRs, dashed lines for network equipment generated CDRs, and double dot-dash line types for CDRs that have been mediated by a service controller 120 and/or mediation system 118.

[00156] In the context of the multiple service provider network embodiments illustrated in Figures 19 through 23, many of the device assisted service techniques disclosed herein that involve a service processor and/or a service controller, including, for example, service usage charging, QoS enabled service usage charging, service usage notification, service usage control, and service usage user feedback UI that apply to the case of improving roaming services or unifying different service provider networks with a common service may be employed. In addition, in some embodiments, the application of verifiable device assisted services (e.g., verifiable service processor service policy adherence) can be accomplished both on the first service provider network and the second service provider network by virtue of the fact that both networks are supplying network generated service usage information to the one or more service controllers and/or proxy servers or routers.

[00157] Accordingly, this allows a number of embodiments for one or not of the service providers, including, for example: common service usage and/or recording platform that can provide unified service usage reporting and/or billing across multiple networks, common network service controls and/or traffic controls across multiple networks, common user information sharing across multiple networks, and common QoS controls across multiple networks, common service design services across multiple networks. It is also possible to unify networks with different access technologies into a common network service. For example, by creating different network interface "shim" software layers, it is possible to interface a common set of service controller capabilities, service processor capabilities, proxy server and/or router capabilities and/or service design interface capabilities into different networks that have different equipment and even different communication protocols for provisioning equipment, CDR collection and aggregation equipment, traffic control equipment, AAA, home agent/HLR, billing systems, QoS reservation and control equipment, and/or other capabilities/protocols. The

equipment software shims translate the different equipment communication protocols for each network into the common protocols supported in the service controller, service processor, proxy server and/or router, and/or service design center apparatus.

[00158] In some embodiments, the techniques described herein to unify network services across multiple networks can be used to provide consistent service control, notification, billing across networks locally or globally without the need to back-haul the data traffic through wholesale pipes from one network to another as is the case with conventional network technologies. For example, a subscriber can be acquired and/or billed for by network #1 and then be serviced with a uniform service experience and deep service notification, control, charging capabilities on both network #1 and network #2. In some embodiments, a subscriber can be acquired and billed for by network #2 and then be serviced with a uniform service experience and deep service notification, control, charging capabilities on both network #1 and network #2. Service plans, settings, notification, carrier branding, etc. can all be the same or different for subscribers originated on one network versus the other. Additionally, in some embodiments, one or more of the service controller, proxy servers or routers and/or other apparatus that handles traffic including the mediation systems can be distributed and/or redundant with diversity as discussed elsewhere to reduce the need to back haul device service traffic or service control traffic. In some embodiments, it is possible for both carrier networks to posses a common service design network element and UI despite the fact that the different networks can have very different provisioning, AAA, traffic handling, charging, billing, etc equipment.

[00159] **Figure 22** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including two service provider networks in accordance with some embodiments, involving one or more of service controllers, service processors and/or proxy server/routers. Figure 22 includes elements that can be identical or very similar to those described in the context of Figures 5 through 8, 16 through 18, and 21 except that in Figure 21 there are two central provider networks where the CDR reporting and service controls are unified through one or more common service controllers 120, service processors 115 and/or proxy server/routers 270. As shown in Figure 22: the charging flows are illustrated using the following three line types: solid lines for device generated CDRs and/or proxy server/router

generated CDRs, dashed lines for network equipment generated CDRs, and double dot-dash line types for CDRs that have been mediated by a service controller 120 and/or mediation system 118.

[00160] **Figure 23** illustrates a wireless network architecture for providing device assisted CDR creation, aggregation, mediation and billing including two service provider networks in accordance with some embodiments, involving one or more of service controllers and/or proxy server/routers. Figure 23 includes elements that may be identical or very similar to those described in the context of Figures 22, except in this case there is no service processor CDR feed and only CDR feeds from the network equipment and the proxy server/routers. As shown in Figure 23, the charging flows are illustrated using the following three line types: solid lines for device generated CDRs and/or proxy server/router generated CDRs, dashed lines for network equipment generated CDRs, and double dot-dash line types for CDRs that have been mediated by a service controller 120 and/or mediation system 118.

[00161] In some embodiments, one or more proxy servers or routers are used to create a common network service between two or more different networks. In some embodiments, one or more proxy servers or routers are used in conjunction with device client (DAS service processor) used to create a common network service between two or more different networks. In some embodiments, one or more proxy servers or routers are used to create a common network service between two or more different networks in which the proxy server is programmed with a centralized service design interface. In some embodiments, one or more proxy servers or routers are used to create a common service usage recording and/or accounting system across different networks. In some embodiments, one or more proxy servers or routers are used in conjunction with device client (e.g., DAS service processor) used to create a common network service between two or more different networks, in which the proxy server and the device client have coordinated policy settings and/or are both controlled by a service controller element in a network.

[00162] In some embodiments, one or more proxy servers or routers are used in conjunction with a device client (e.g., DAS service processor) to create a common network service between two or more different networks in which the proxy router and the device client

have coordinated policy settings and/or are both controlled by a service controller element in a network.

[00163] In some embodiments, one or more proxy servers or routers are used to create a common network service between two or more different networks in which the proxy server is programmed with a centralized service design interface and the is controlled by a service controller element in a network.

[00164] In some embodiments, one or more proxy servers or routers are used to create a common network service between two or more different networks in which the proxy server is programmed with a centralized service design interface and one or more of the service policies are is controlled by a service controller element in a network. In some embodiments, one or more proxy servers or routers are used to create a coordinated QoS signaling, reservation, provisioning, control, charging, and/or user interface across different service provider networks.

[00165] Those of ordinary skill in the art will appreciate that various other rules can be provided for the rules engine as described herein. Those of ordinary skill in the art will also appreciate that the functions described herein can be implemented using various other network architectures and network implementations (e.g., using various other networking protocols and corresponding network equipment and techniques).

[00166] Although the foregoing embodiments have been described in some detail for purposes of clarity of understanding, the invention is not limited to the details provided. There are many alternative ways of implementing the invention. The disclosed embodiments are illustrative and not restrictive.

[00167] WHAT IS CLAIMED IS:

CLAIMS

1. A system, comprising:

a processor of a proxy network device in communication with a wireless network, wherein the processor is configured to:

collect device generated service usage information for one or more devices in wireless communication on the wireless network; and

provide the device generated service usage information in a syntax and a communication protocol that can be used by other network devices to augment or replace network generated service usage information for the one or more devices in wireless communication on the wireless network; and

a memory coupled to the processor and configured to provide the processor with instructions.

2. The system recited in claim 1, wherein the proxy network device includes a proxy server.

3. The system recited in claim 1, wherein the proxy network device includes a proxy router.

4. The system recited in claim 1, wherein the proxy network device provides a common network service between two or more networks.

5. The system recited in claim 1, wherein the proxy network device is programmed using a centralized service design interface.

6. The system recited in claim 1, wherein the service usage information includes network service usage information.

7. The system recited in claim 1, wherein the syntax is a charging data record (CDR).

8. The system recited in claim 1, wherein the service usage information includes network service usage information.

9. The system recited in claim 1, wherein the proxy network device includes a service usage data store.

10. The system recited in claim 1, wherein the proxy network device includes a service usage data store and a rules engine for aggregating the collected device generated service usage information.

11. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to:

aggregate device assisted CDRs for the one or more devices in wireless communication on the wireless network; and

apply a set of rules to the aggregated CDRs using a rules engine.

12. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to:

aggregate device assisted CDRs for the one or more devices in wireless communication on the wireless network;

apply a set of rules to the aggregated device assisted CDRs using a rules engine; and

communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system.

13. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to:

aggregate device assisted CDRs for the one or more devices in wireless communication on the wireless network;

verify the aggregated device assisted CDRs; and

communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system.

14. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to:

aggregate device assisted CDRs for the one or more devices in wireless communication on the wireless network;

verify the aggregated device assisted CDRs by comparing at least a subset of the aggregated device assisted CDRs to a set of network generated CDRs for the one or more devices in wireless communication on the wireless network; and

communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system based on the verifying of the aggregated device assisted CDRs.

15. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to:

aggregate device assisted CDRs for the one or more devices in wireless communication on the wireless network;

apply a set of rules to the aggregated CDRs using a rules engine, wherein at least one rule includes a bill by account rule; and

communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system.

16. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and the proxy network device includes a CDR feed aggregator, and wherein the processor is further configured to:

aggregate device assisted CDRs for the one or more devices in wireless communication on the wireless network;

apply a set of rules to the aggregated device assisted CDRs using a rules engine, wherein at least one rule includes a bill by account rule; and

communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system, wherein at least one CDR includes a billing offset.

17. The system recited in claim 1, wherein the syntax is a charging data record (CDR), and the network device includes a CDR feed aggregator, and wherein the processor is further configured to:

communicate a new set of CDRs for the one or more devices in wireless communication on the wireless network to a billing interface or a billing system.

18. The system recited in claim 1, wherein the processor is further configured to:

communicate with a service controller to collect the device generated service usage information for the one or more devices in wireless communication on the wireless network.

19. The system recited in claim 1, wherein the processor is further configured to:

communicate with a service controller, wherein the service controller is in communication with a billing interface or a billing system, and wherein the service controller communicates the device generated service usage information to the network device.

20. The system recited in claim 1, wherein the processor is further configured to:

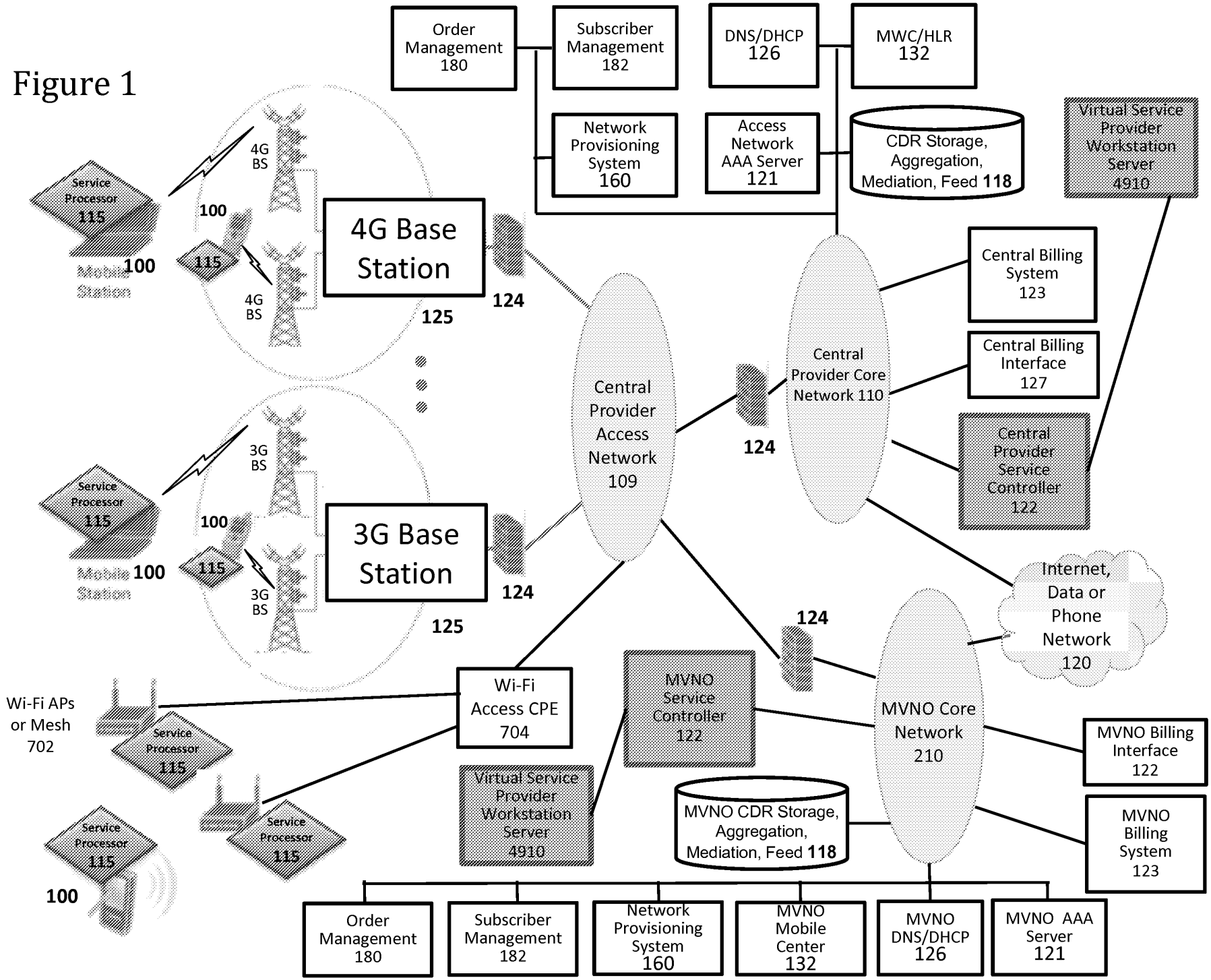
communicate the device generated service usage information to a billing interface or a billing system.

ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY

ABSTRACT OF THE DISCLOSURE

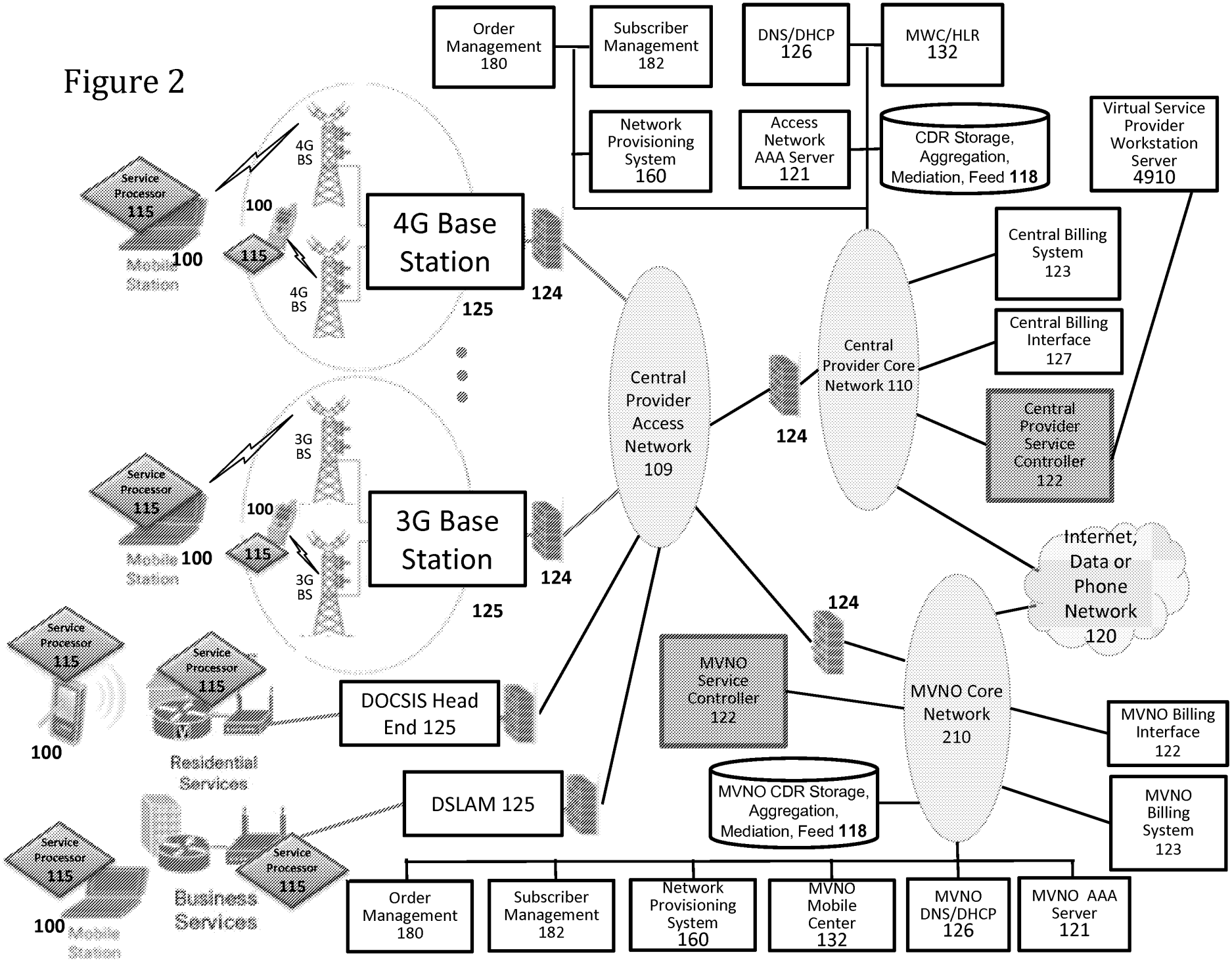
[00168] Enhanced roaming services and converged networks with device assisted services and a proxy is provided. In some embodiments, enhanced roaming services and converged networks with device assisted services and a proxy includes collecting device generated service usage information for one or more devices in wireless communication on the wireless network; and providing the device generated service usage information in a syntax and a communication protocol that can be used by other network devices to augment or replace network generated service usage information for the one or more devices in wireless communication on the wireless network.

Figure 1


Order Management 180
Subscriber Management 182
DNS/DHCP 126
MWC/HLR 132
Network Provisioning System 160
Access Network AAA Server 121
CDR Storage, Aggregation, Mediation, Feed 118
Virtual Service Provider Workstation Server 4910
4G BS
Service Processor 115
100
Mobile Station
4G Base Station
125
124
Central Billing System 123
Central Billing Interface 127
Central Provider Core Network 110
Central Provider Access Network 109
Central Provider Service Controller 122
3G BS
3G Base Station
Internet, Data or Phone Network 120
Wi-Fi APs or Mesh 702
Wi-Fi Access CPE 704
MVNO Service Controller 122
MVNO Core Network 210
MVNO Billing Interface 122
MVNO Billing System 123
MVNO CDR Storage, Aggregation, Mediation, Feed 118
Virtual Service Provider Workstation Server 4910
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Subscriber Management 182
Network Provisioning System 160
MVNO Mobile Center 132
MVNO DNS/DHCP 126
MVNO AAA Server 121

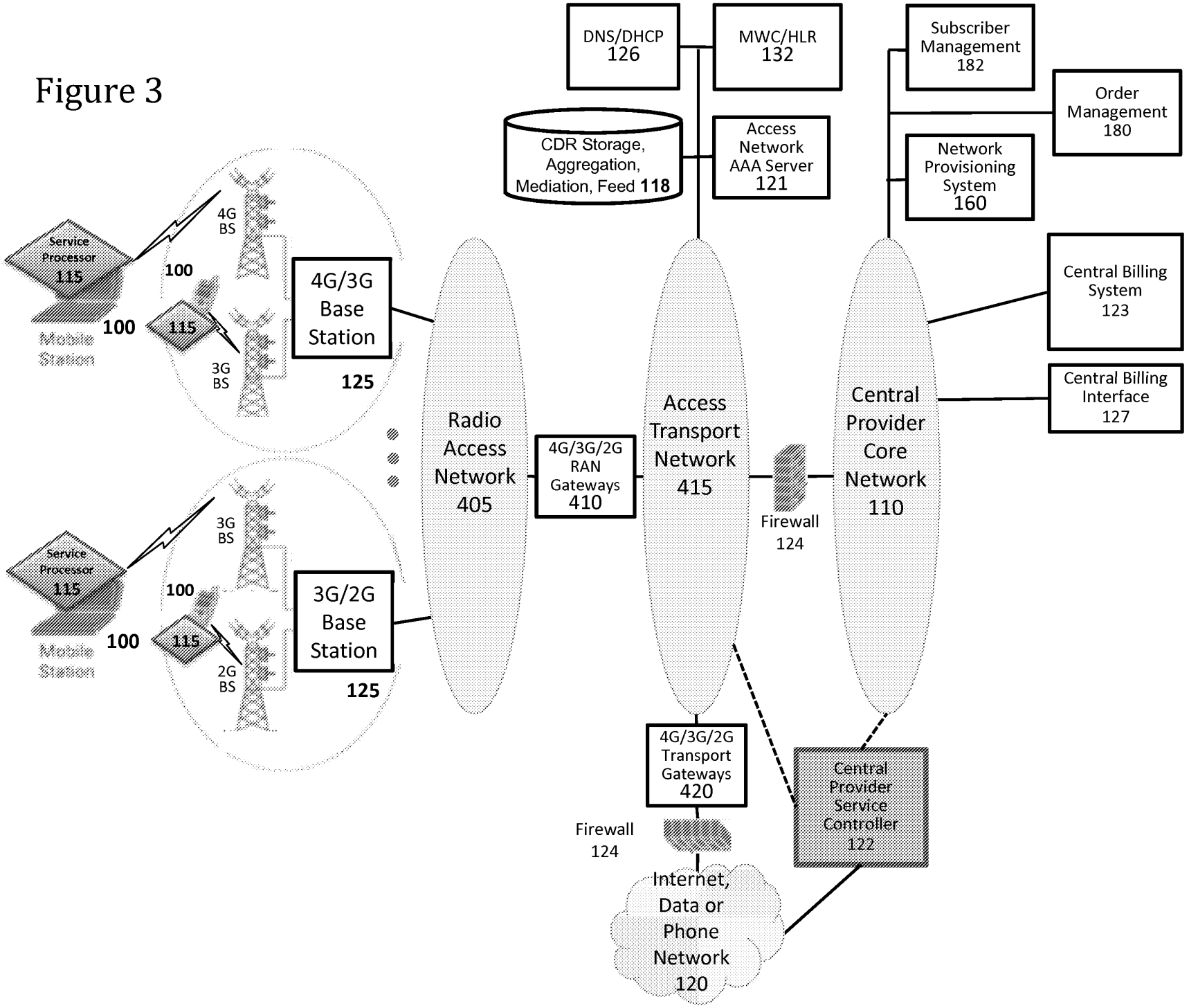
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Figure 2


Order Management 180
Subscriber Management 182
DNS/DHCP 126
MWC/HLR 132
Network Provisioning System 160
Access Network AAA Server 121
CDR Storage, Aggregation, Mediation, Feed 118
Virtual Service Provider Workstation Server 4910
Central Billing System 123
Central Billing Interface 127
Central Provider Core Network 110
Central Provider Service Controller 122
Central Provider Access Network 109
4G Base Station
3G Base Station
4G BS
3G BS
Service Processor 115
Mobile Station
100
115
124
125
Internet, Data or Phone Network 120
MVNO Service Controller 122
MVNO Core Network 210
MVNO Billing Interface 122
MVNO Billing System 123
MVNO CDR Storage, Aggregation, Mediation, Feed 118
DOCSIS Head End 125
DSLAM 125
Residential Services
Business Services
Order Management 180
Subscriber Management 182
Network Provisioning System 160
MVNO Mobile Center 132
MVNO DNS/DHCP 126
MVNO AAA Server 121

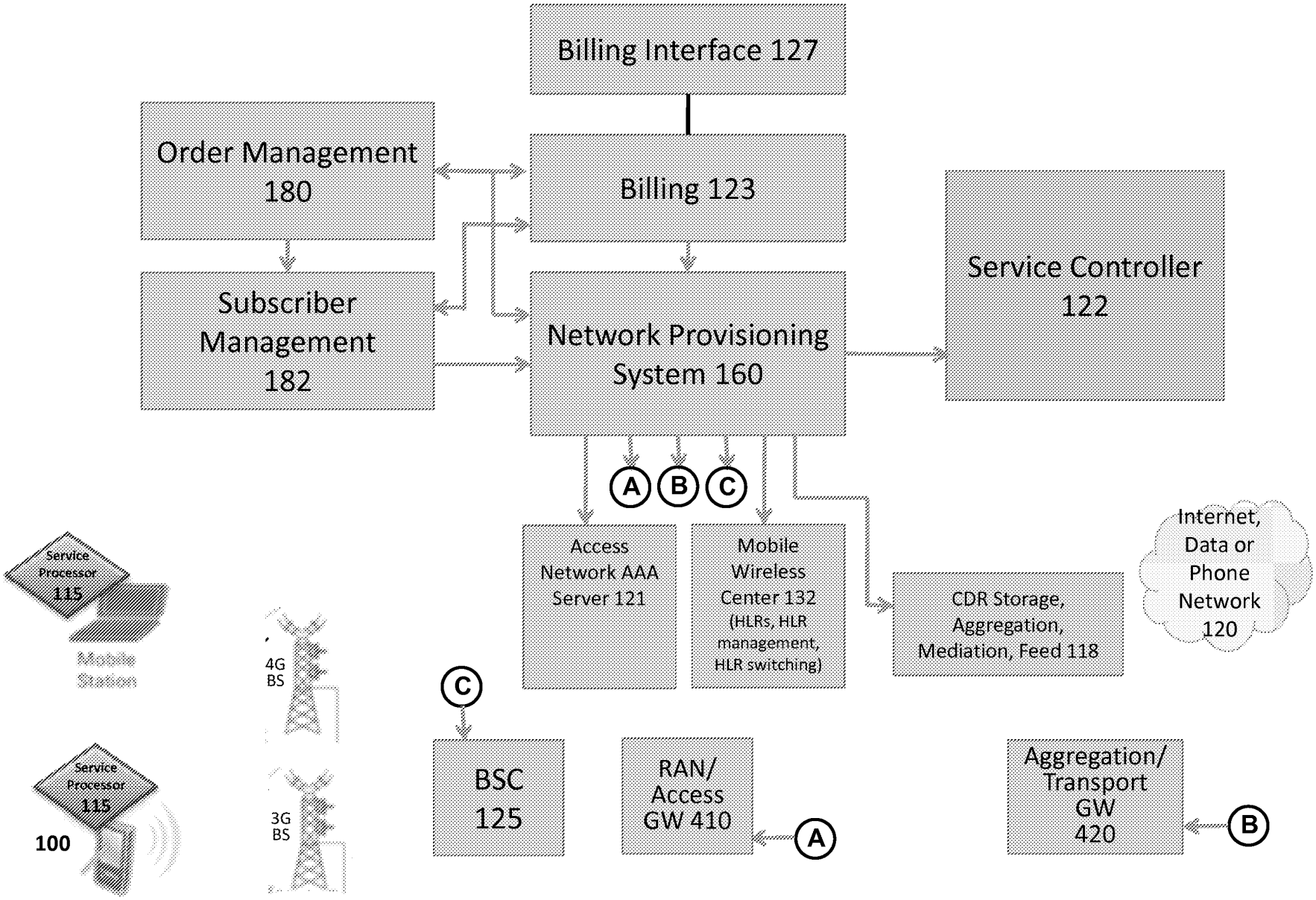
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Figure 3


DNS/DHCP
126
MWC/HLR
132
Subscriber Management
182
Order Management
180
CDR Storage, Aggregation, Mediation, Feed 118
Access Network AAA Server
121
Network Provisioning System
160
Central Billing System
123
Central Billing Interface
127
Service Processor
115
4G BS
100
Mobile Station
3G BS
4G/3G Base Station
125
Radio Access Network
405
4G/3G/2G RAN Gateways
410
Access Transport Network
415
Firewall
124
Central Provider Core Network
110
Service Processor
115
3G BS
100
Mobile Station
2G BS
3G/2G Base Station
125
4G/3G/2G Transport Gateways
420
Firewall
124
Central Provider Service Controller
122
Internet, Data or Phone Network
120

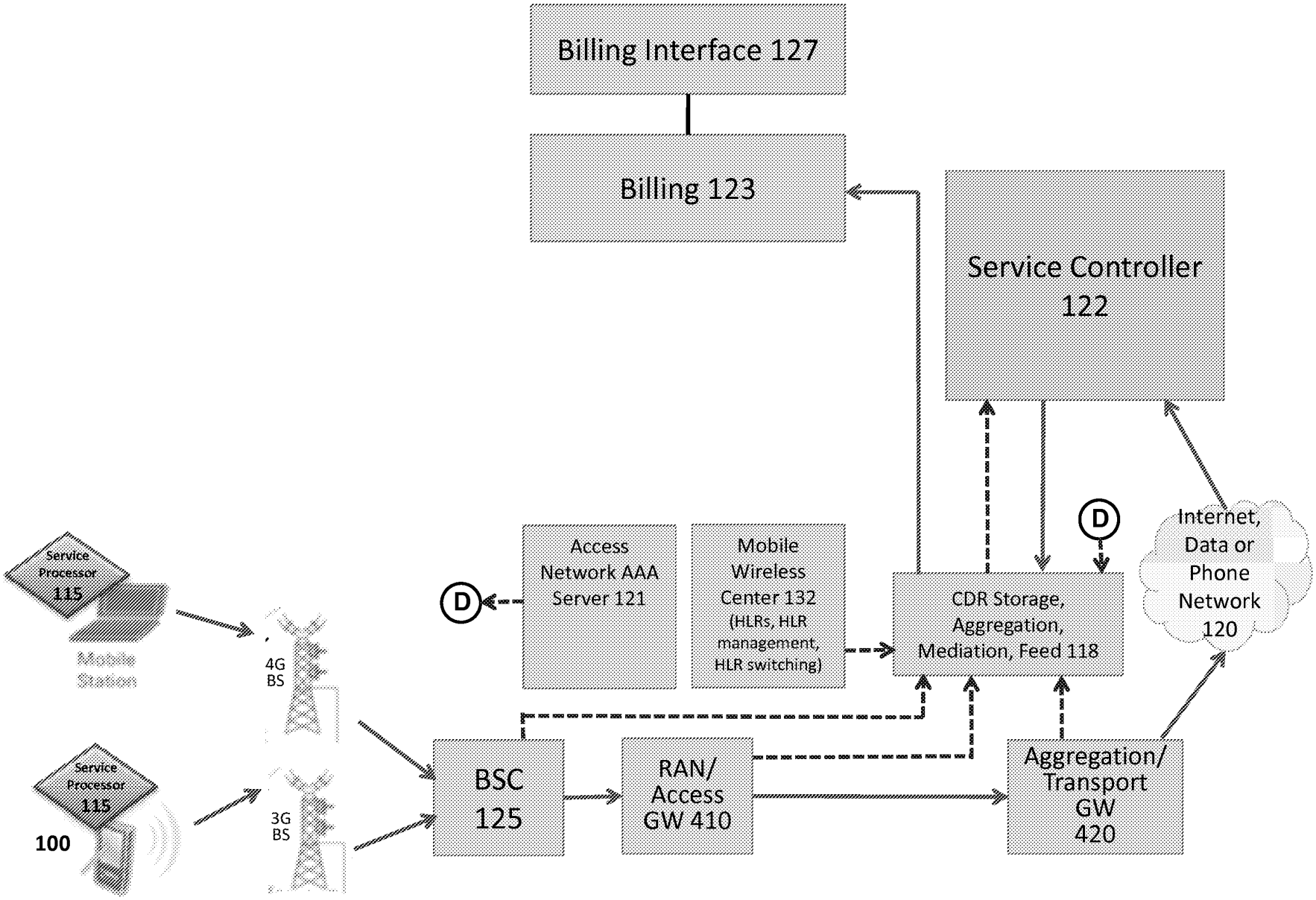
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Figure 4


Billing Interface 127
Order Management 180
Billing 123
Subscriber Management 182
Network Provisioning System 160
Service Controller 122
A
B
C
Access Network AAA Server 121
Mobile Wireless Center 132 (HLRs, HLR management, HLR switching)
CDR Storage, Aggregation, Mediation, Feed 118
Internet, Data or Phone Network 120
Service Processor 115
Mobile Station
4G BS
3G BS
Service Processor 115
100
C
BSC 125
RAN/ Access GW 410
A
Aggregation/ Transport GW 420
B

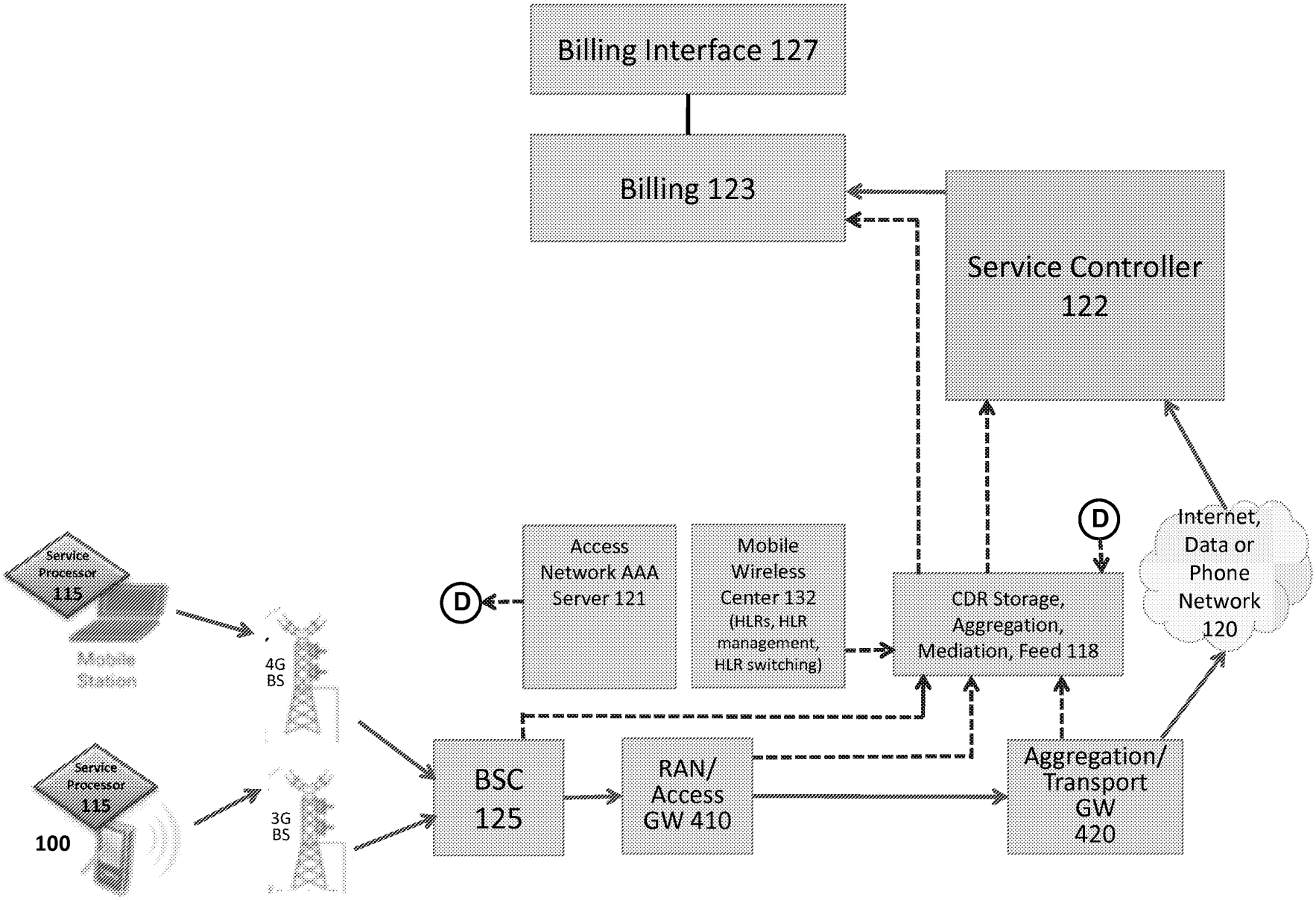
309

Figure 5


Billing Interface 127
Billing 123
Service Controller 122
Service Processor 115
Mobile Station
4G BS
Service Processor 115
100
3G BS
Access Network AAA Server 121
Mobile Wireless Center 132 (HLRs, HLR management, HLR switching)
CDR Storage, Aggregation, Mediation, Feed 118
D
D
Internet, Data or Phone Network 120
BSC 125
RAN/ Access GW 410
Aggregation/ Transport GW 420

310

Figure 6


Billing Interface 127
Billing 123
Service Controller 122
Service Processor 115
Mobile Station
4G BS
Service Processor 115
100
3G BS
Access Network AAA Server 121
Mobile Wireless Center 132 (HLRs, HLR management, HLR switching)
CDR Storage, Aggregation, Mediation, Feed 118
D
D
Internet, Data or Phone Network 120
BSC 125
RAN/ Access GW 410
Aggregation/ Transport GW 420

311

Figure 7

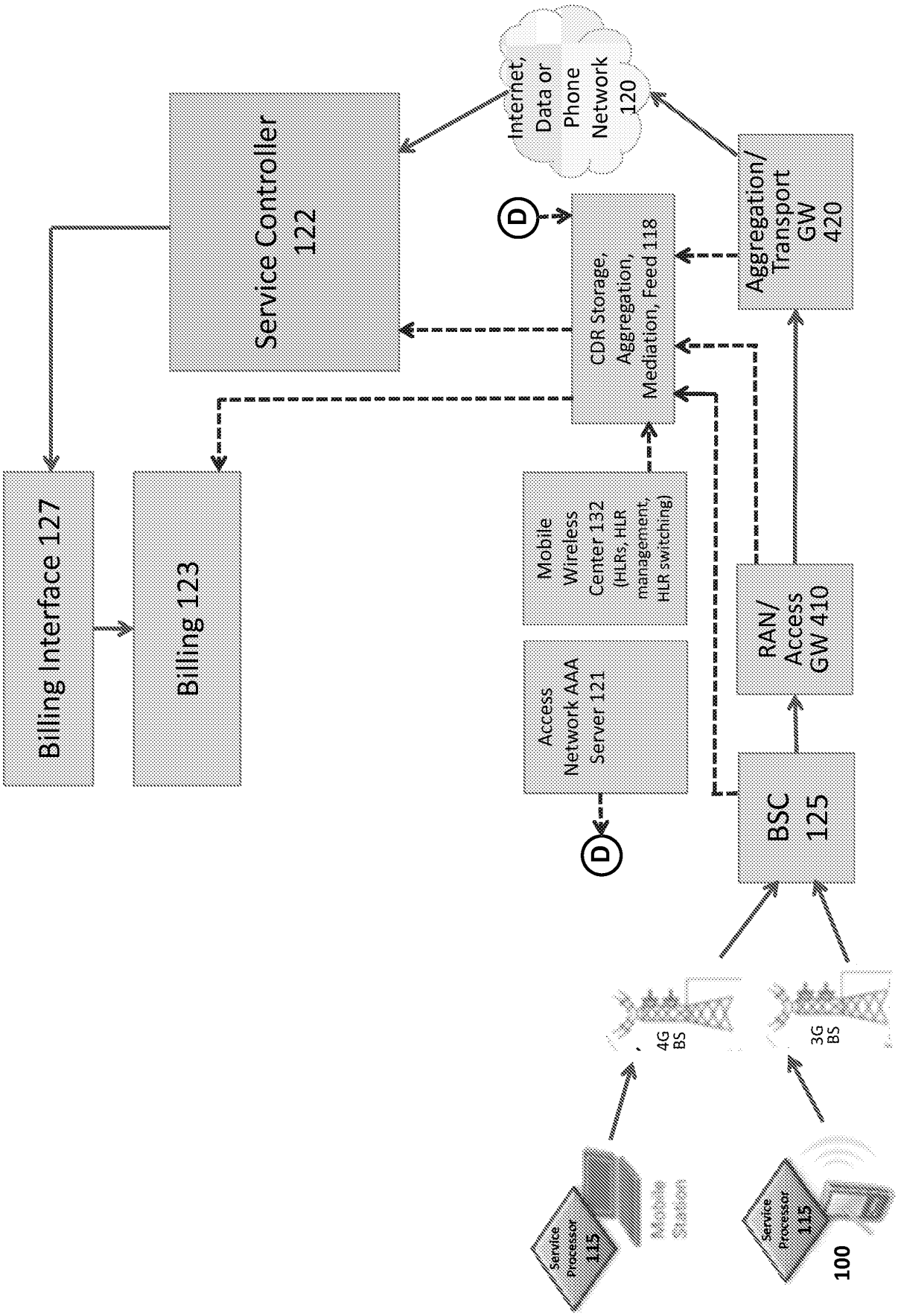
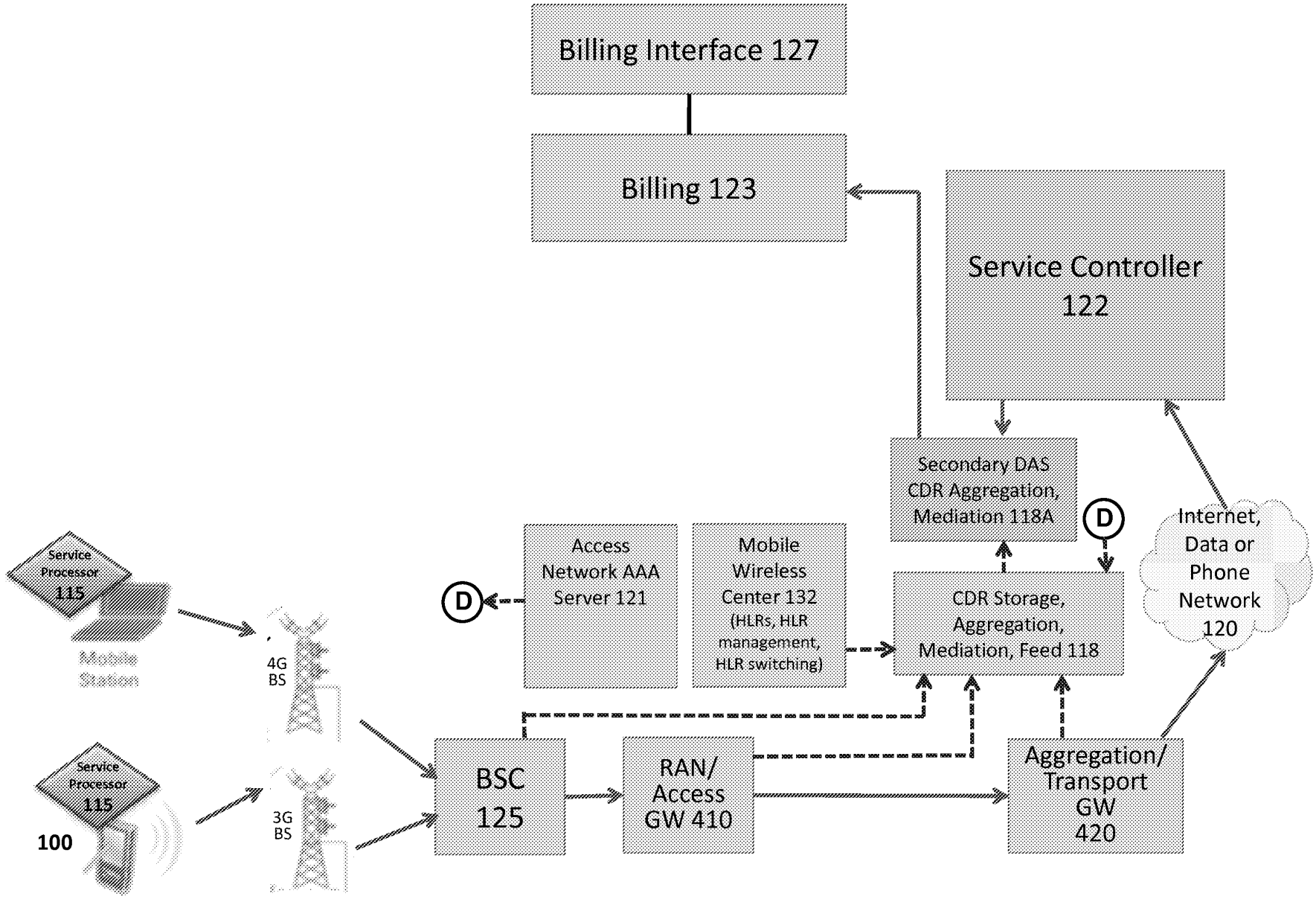

Billing Interface 127
Billing 123
Service Controller 122
Internet, Data or Phone Network 120
CDR Storage, Aggregation, Mediation, Feed 118
Aggregation/ Transport GW 420
Mobile Wireless Center 132 (HLRs, HLR management, HLR switching)
Access Network AAA Server 121
RAN/ Access GW 410
BSC 125
4G BS
3G BS
Service Processor 115
Service Processor 115
100

Figure 8


Billing Interface 127
Billing 123
Service Controller 122
Secondary DAS CDR Aggregation, Mediation 118A
D
Internet, Data or Phone Network 120
Access Network AAA Server 121
Mobile Wireless Center 132 (HLRs, HLR management, HLR switching)
CDR Storage, Aggregation, Mediation, Feed 118
Service Processor 115
Mobile Station
4G BS
Service Processor 115
100
3G BS
BSC 125
RAN/ Access GW 410
Aggregation/ Transport GW 420

313

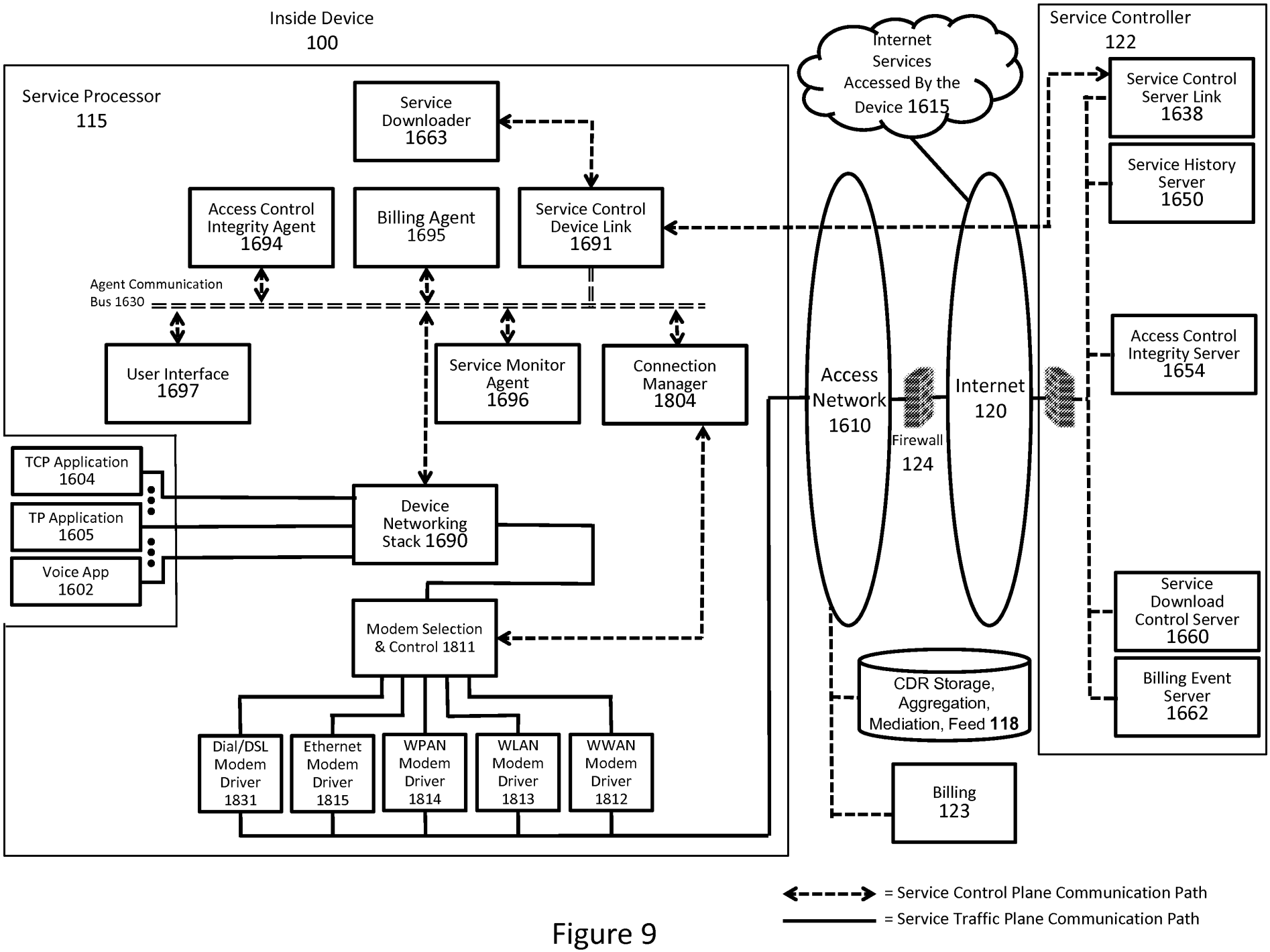

Inside Device
100
Service Processor
115
Service Downloader
1663
Access Control Integrity Agent
1694
Billing Agent
1695
Service Control Device Link
1691
Agent Communication Bus 1630
User Interface
1697
Service Monitor Agent
1696
Connection Manager
1804
TCP Application
1604
TP Application
1605
Voice App
1602
Device Networking Stack 1690
Modem Selection & Control 1811
Dial/DSL Modem Driver
1831
Ethernet Modem Driver
1815
WPAN Modem Driver
1814
WLAN Modem Driver
1813
WWAN Modem Driver
1812
Internet Services Accessed By the Device 1615
Access Network
1610
Firewall
124
Internet
120
CDR Storage, Aggregation, Mediation, Feed 118
Billing
123
Service Controller
122
Service Control Server Link
1638
Service History Server
1650
Access Control Integrity Server
1654
Service Download Control Server
1660
Billing Event Server
1662
314
= Service Control Plane Communication Path
= Service Traffic Plane Communication Path

Figure 9

Service Processor 115 Embodiment	Partial Summary of Embodiment Functions
Service Control Device Link 1691	Device side control plane link for connecting Service Processor 415 to Service Controller. In some embodiments, also serves as the link for the agent heartbeat function.
Access Control Integrity Agent 1694	Collects device information on service policy, service usage, agent configuration and agent behavior. Cross checks this information to identify integrity breaches in the service policy implementation and control system. Initiates action when a service policy violation or a system integrity breach is suspected. In some embodiments, verifies configuration of other agents or performs challenge-response sequence testing. In some embodiments, monitors software loading activity, protected memory access or communication with Service Processor agents to detect unauthorized changes to Service Processor software or configuration.
Service Monitor Agent 1696	Records and reports device service usage. In some embodiments, assists in communicating application tagging of traffic flows through the networking stack policy implementation. In some embodiments, maintains a history and provides reports or summary reports of which networks in addition to the networks controlled by the Service Controller that the device has connected to. In some embodiments, this network activity summary may include a summary of the networks accessed, activity vs. time per connection, traffic vs. time per connection.
Billing Agent 1695	Detects and reports billing events. In some embodiments interacts with the User Interface Agent 497 to provide the user with service plan options, accept service plan selections, provide notification on service usage levels, provide options on service usage control policy, accept choices on service usage policy, provide transaction options or accept transaction choices. In some embodiments, interacts with Transaction Servers 134 to conduct ecommerce transactions with central billing.
User Interface 1697	Provide service interface to users.
Service Downloader 1663	Provides a download function to install or update service software elements on the device.
Connection Manager 1804	Provides a control and supervision function for one or more modem drivers or modems that connect to an access network.
Modem Selection and Control 1811	Selects the access network connection.
Modem Drivers 1831, 1815, 1814, 1813, 1812	Converts data traffic into modem bus traffic for one or more modems.
Modems 2141, 2125, 2124, 2123, 2122	Connects the device to one or more networks.

315

Figure 10

Service Controller 122 Element	Partial Summary of Embodiment Functions
Service Control Server Link 1638	Network side control plane link for connecting Service Controller 422 Service Processor 415 device agents. In some embodiments, also serves as the link for the agent heartbeat function.
Access Control Integrity Server 1654	Collects device information on service policy, service usage, agent configuration and agent behavior. Cross checks this information to identify integrity breaches in the service policy implementation and control system. Initiates action when a service policy violation or a system integrity breach is suspected.
Service History Server 118	Collects and records service usage reports from the Access Network AAA Server 421 and the Service Monitor Agent 496. In some embodiments, maintains a history of which networks in addition to the networks controlled by the Service Controller that the device has connected to. In some embodiments, this network activity summary may include a summary of the networks accessed, activity vs. time per connection, traffic vs. time per connection. In some embodiments, this activity summary is further analyzed or reported to estimate the type of service plan associated with the traffic activity for the purpose of bill sharing reconciliation.
Central Provider Billing System 123	Provides mediation function for central provider billing events. Accepts service plan changes. In some embodiments, provides updates on device service usage, service plan limits or service policies.
Billing Event Server 1662	In some embodiments, collects billing events, provides service plan information to the Service Processor 415, provides service usage updates to the Service Processor 415, serves as interface between device and central Provider Billing System 123, or provides trusted third party function for certain ecommerce billing transactions.
Service Download Control Server 1660	Provides a download function to install or update service software elements on the device.

316

Figure 11

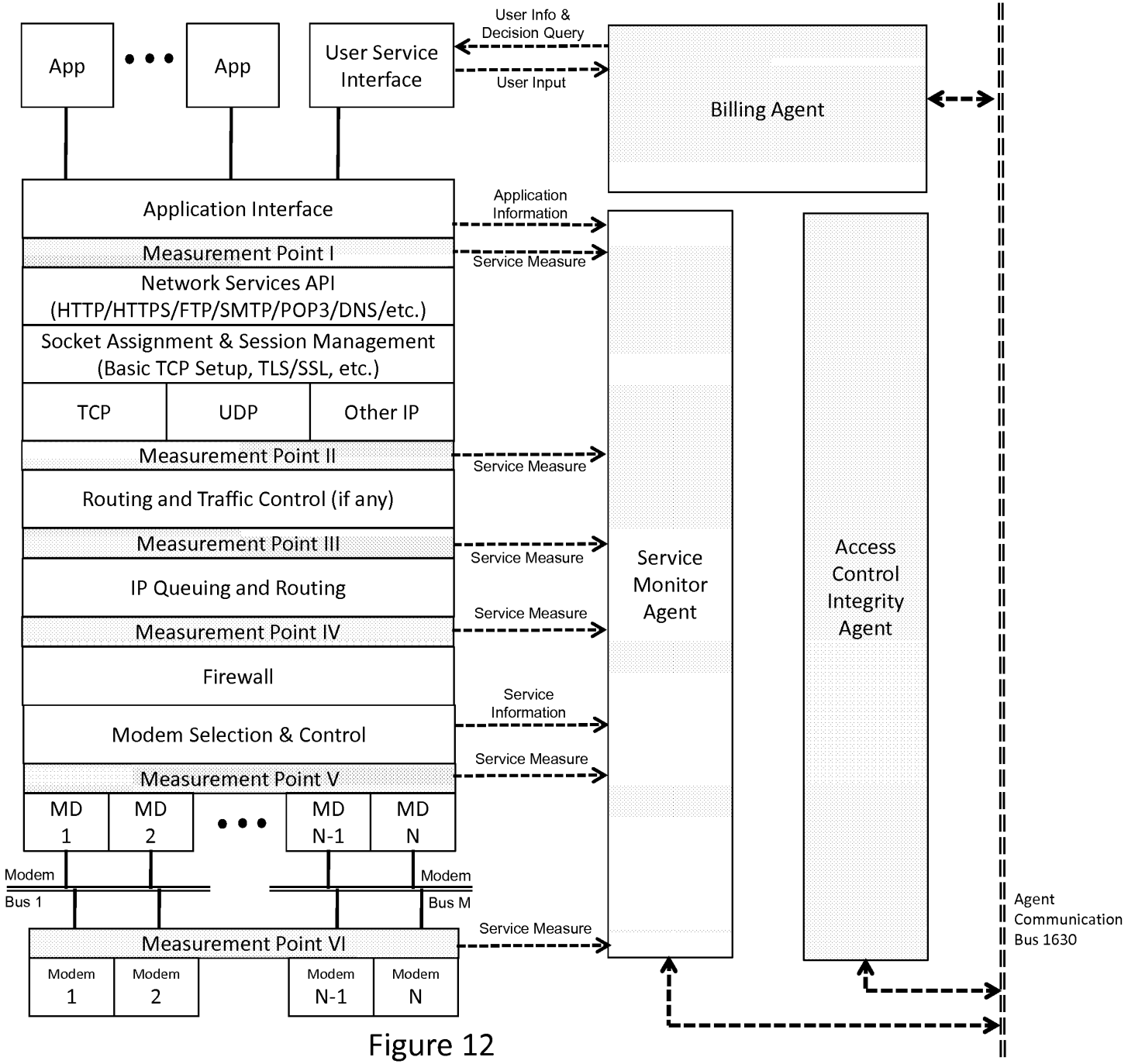

App
App
User Service Interface
User Info & Decision Query
User Input
Billing Agent
Application Interface
Application Information
Measurement Point I
Service Measure
Network Services API (HTTP/HTTPS/FTP/SMTP/POP3/DNS/etc.)
Socket Assignment & Session Management (Basic TCP Setup, TLS/SSL, etc.)
TCP
UDP
Other IP
Measurement Point II
Service Measure
Routing and Traffic Control (if any)
Measurement Point III
Service Measure
IP Queuing and Routing
Service Measure
Measurement Point IV
Firewall
Service Information
Modem Selection & Control
Service Measure
Measurement Point V
MD 1
MD 2
MD N-1
MD N
Modem Bus 1
Modem Bus M
Service Measure
Measurement Point VI
Modem 1
Modem 2
Modem N-1
Modem N
Service Monitor Agent
Access Control Integrity Agent
Agent Communication Bus 1630

Figure 12

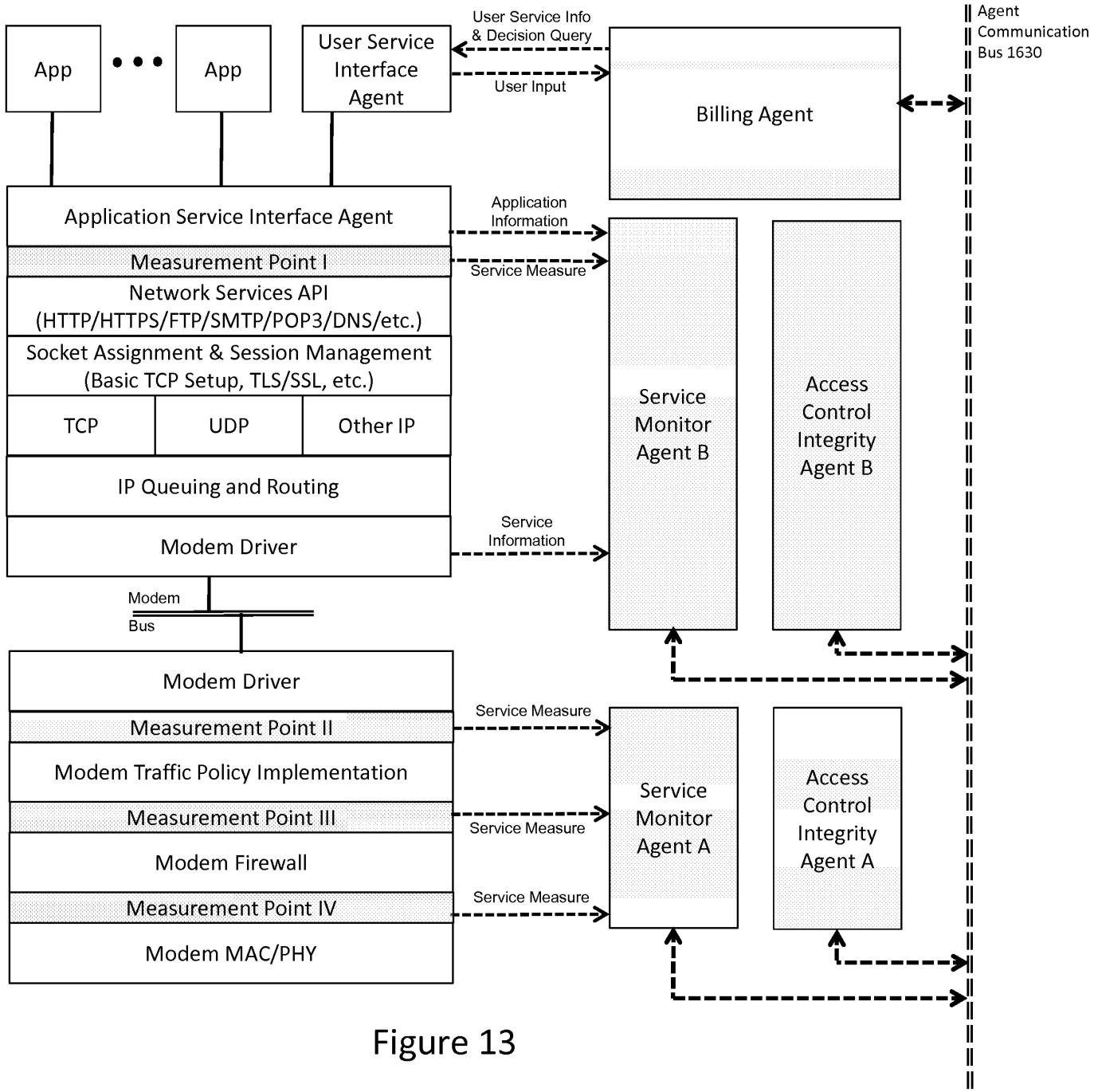


Figure 13

318

Figure 14(A)

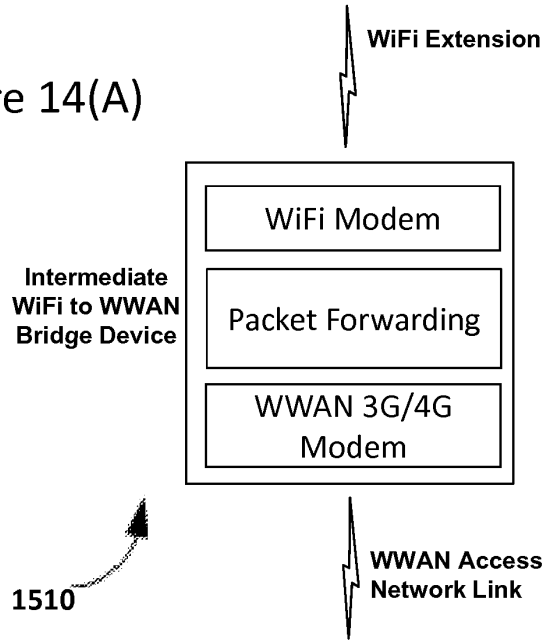
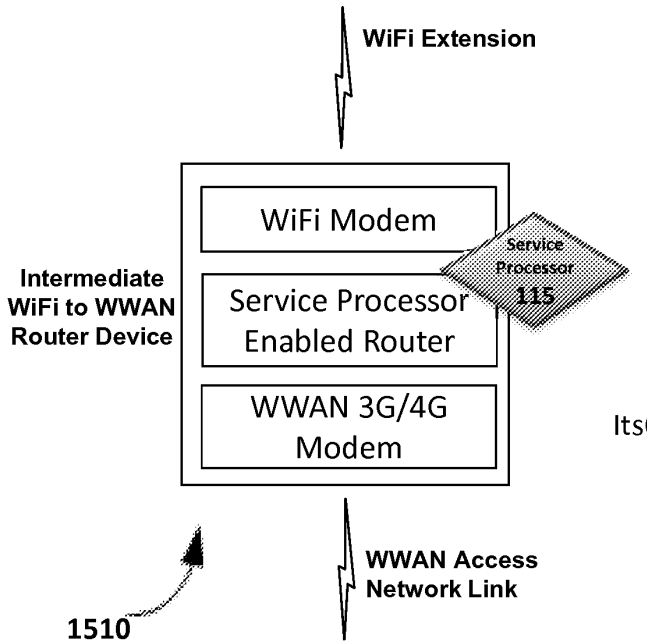


Figure 14(B)



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Figure 14

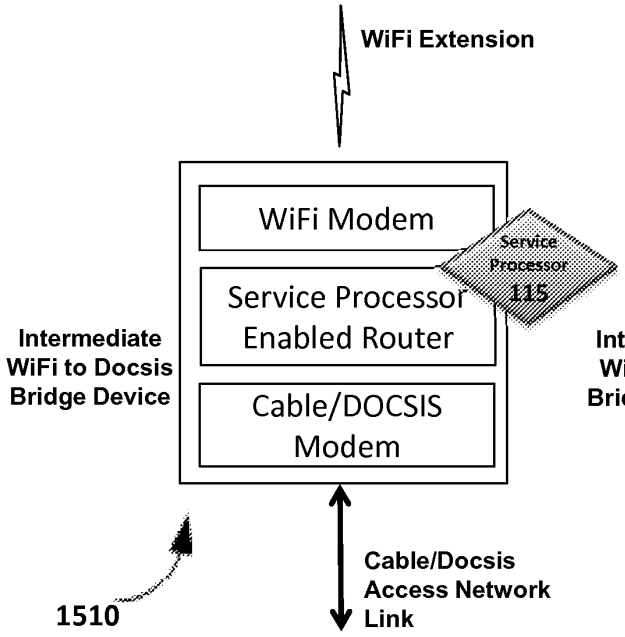


Figure 14(C)

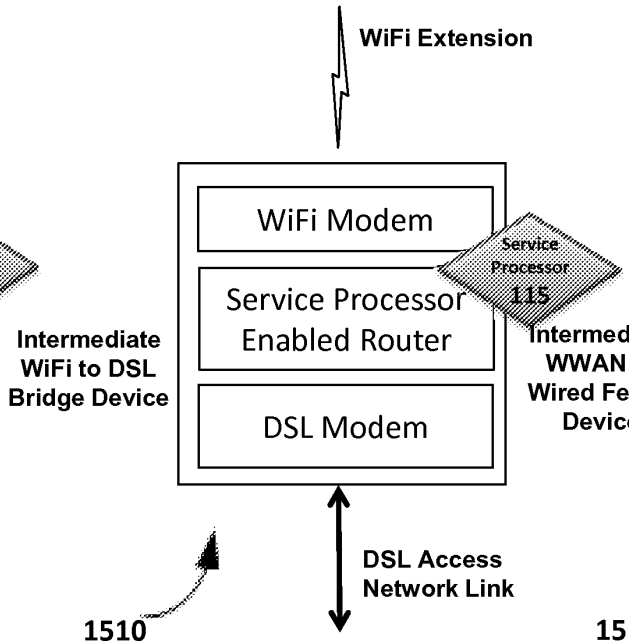


Figure 14 (D)

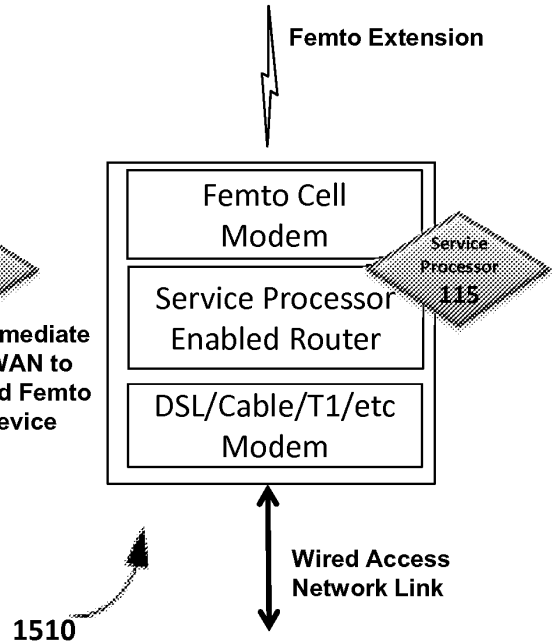


Figure 14 (E)

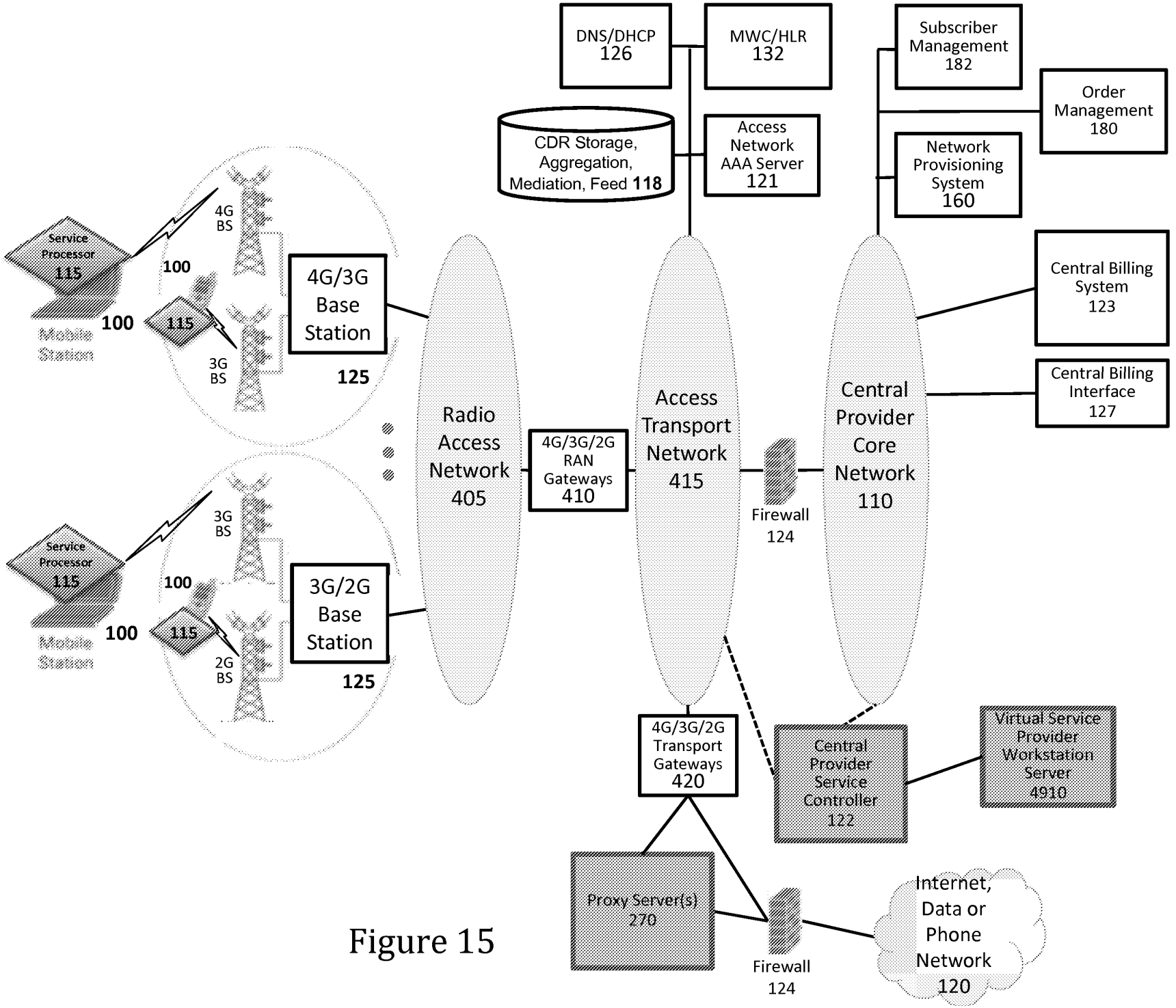


Figure 15

320

Figure 16

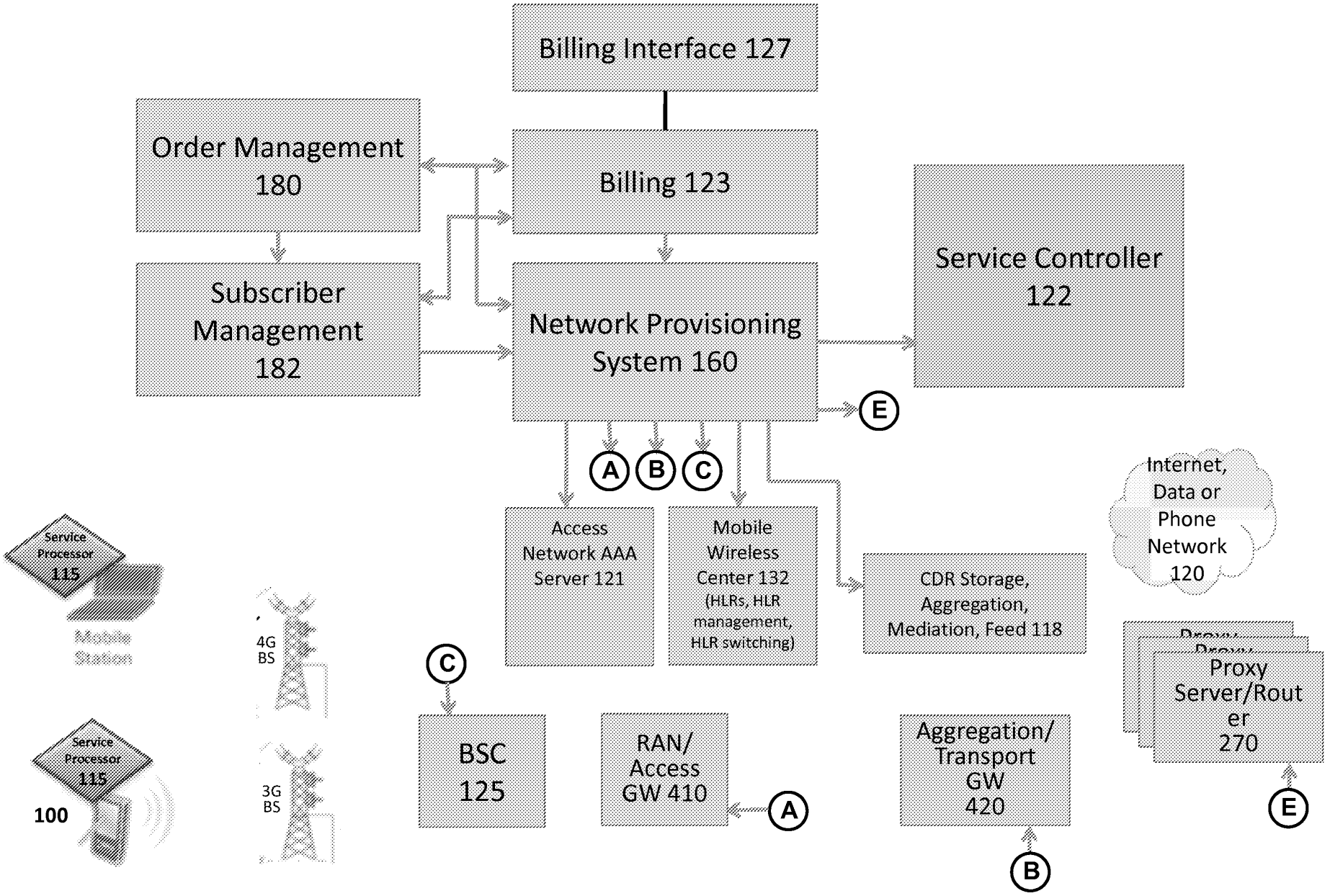

Billing Interface 127
Order Management 180
Billing 123
Subscriber Management 182
Network Provisioning System 160
Service Controller 122
E
A
B
C
Access Network AAA Server 121
Mobile Wireless Center 132 (HLRs, HLR management, HLR switching)
CDR Storage, Aggregation, Mediation, Feed 118
Internet, Data or Phone Network 120
Service Processor 115
Mobile Station
100
4G BS
3G BS
C
BSC 125
RAN/ Access GW 410
A
Aggregation/ Transport GW 420
B
Proxy Server/Router 270
E

Figure 17

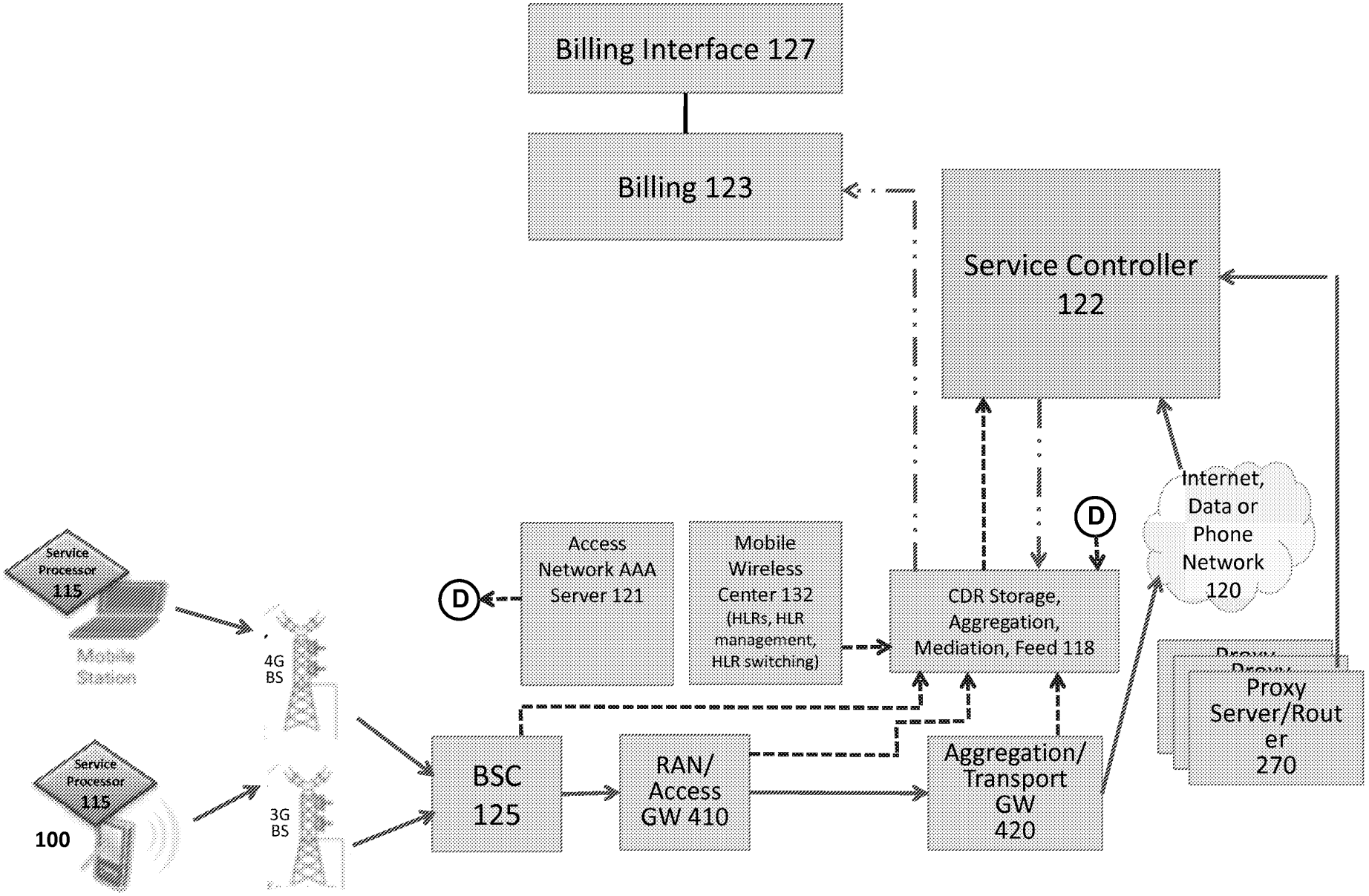
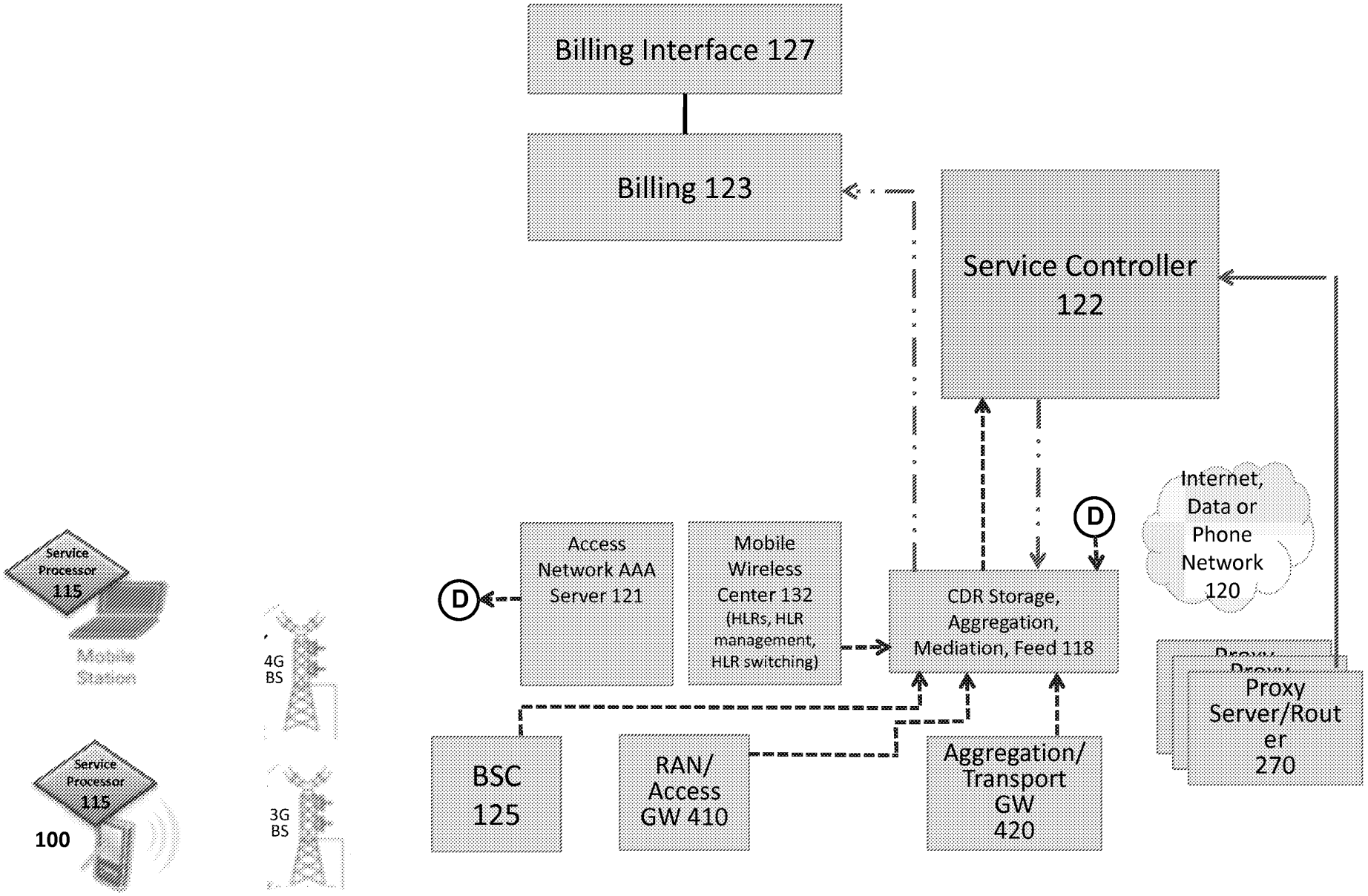

Billing Interface 127
Billing 123
Service Controller 122
322
Service Processor 115
Mobile Station
4G BS
Service Processor 115
100
3G BS
D
Access Network AAA Server 121
Mobile Wireless Center 132 (HLRs, HLR management, HLR switching)
CDR Storage, Aggregation, Mediation, Feed 118
D
Internet, Data or Phone Network 120
Proxy Server/Router 270
BSC 125
RAN/ Access GW 410
Aggregation/ Transport GW 420

Figure 18



323

Figure 19

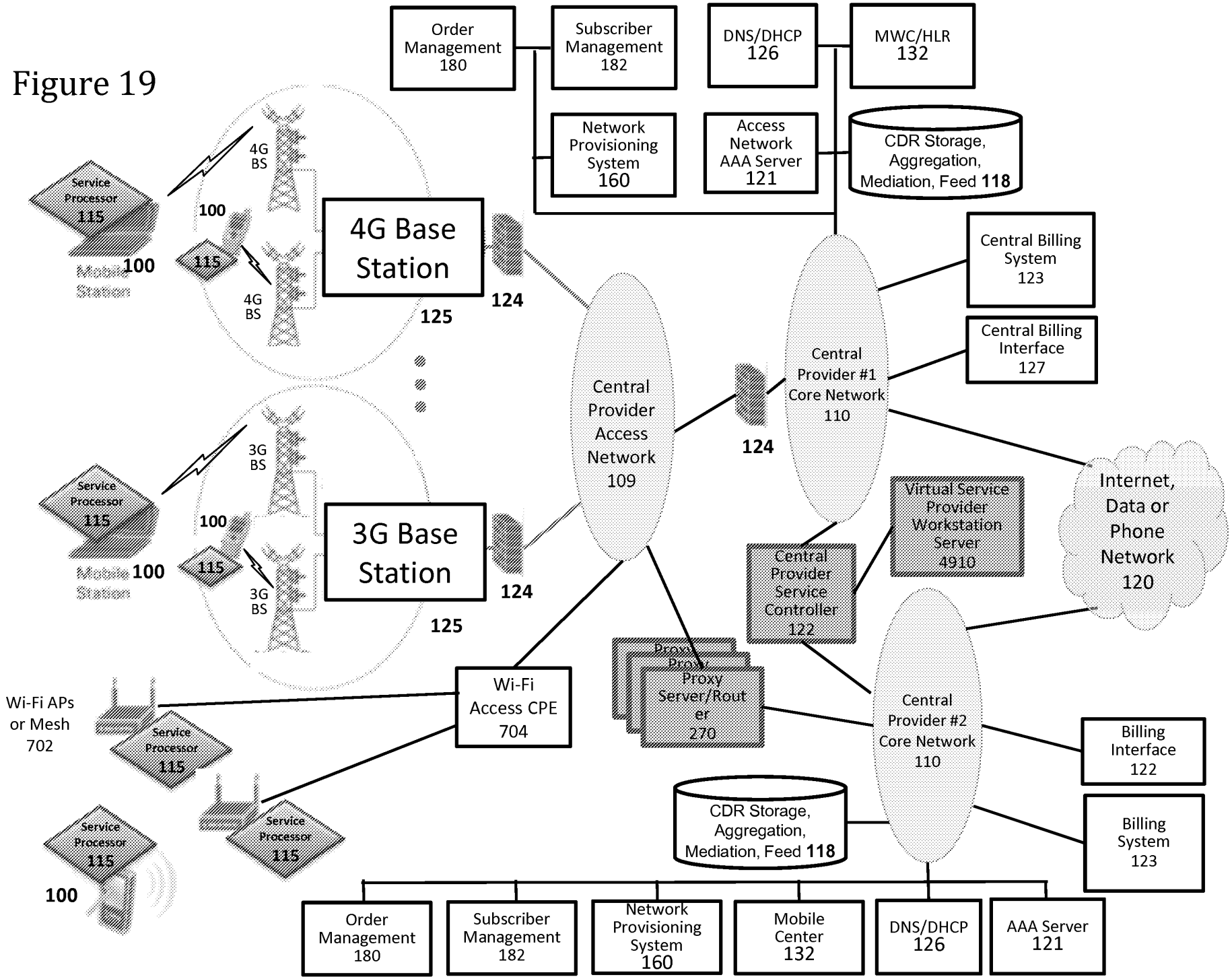
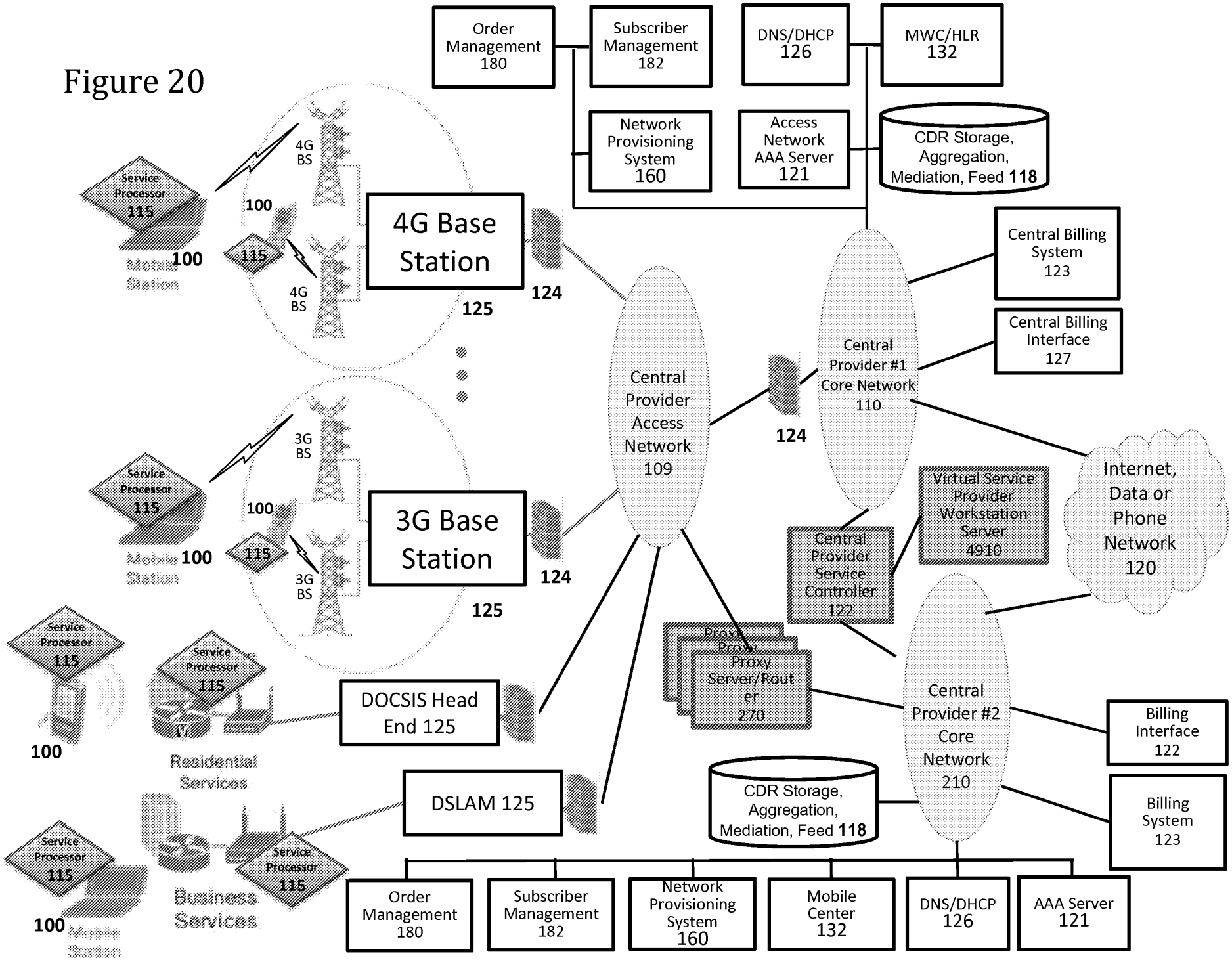
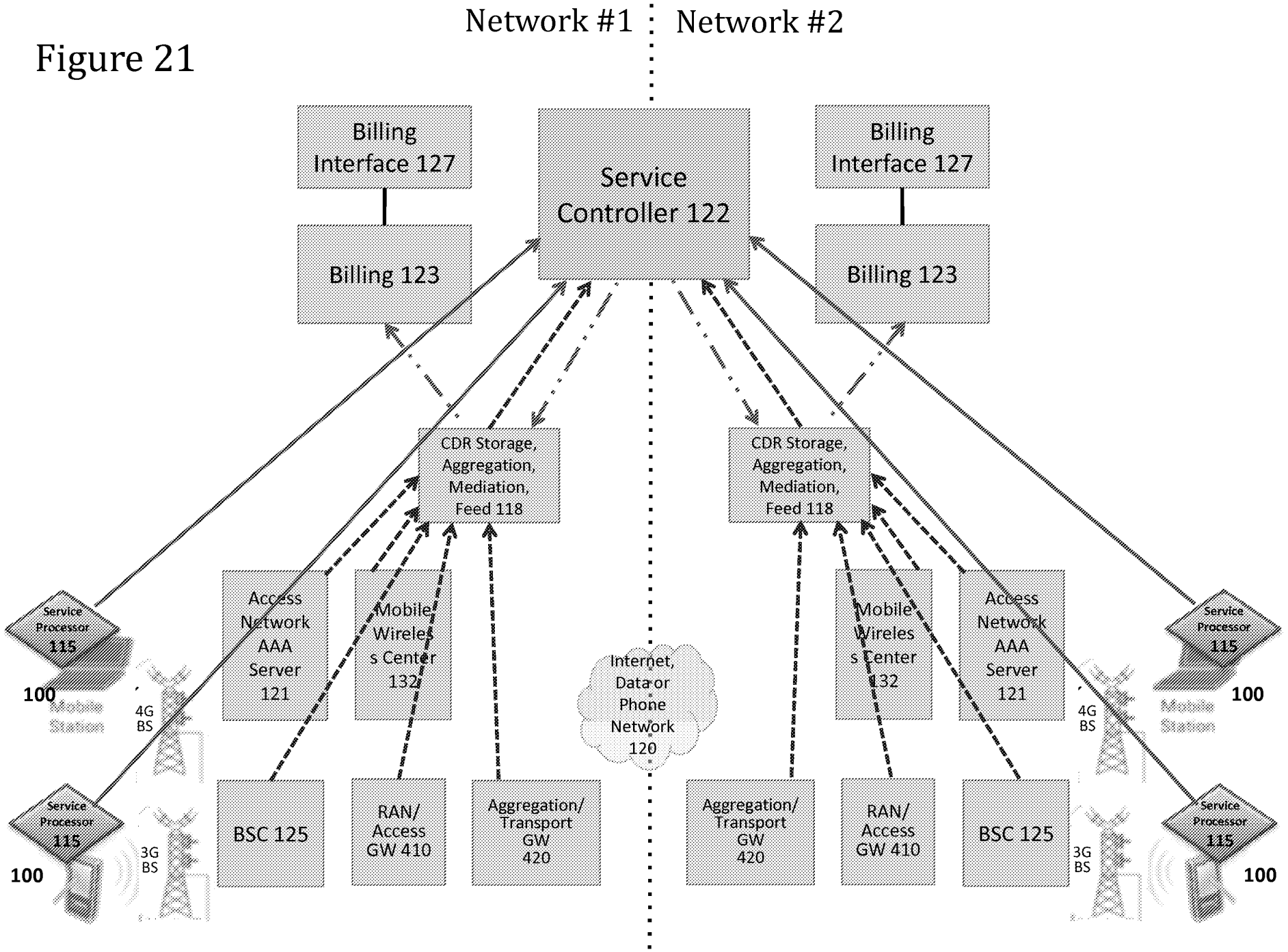

Order Management 180
Subscriber Management 182
DNS/DHCP 126
MWC/HLR 132
Network Provisioning System 160
Access Network AAA Server 121
CDR Storage, Aggregation, Mediation, Feed 118
Central Billing System 123
Central Billing Interface 127
4G Base Station
125
124
4G BS
Service Processor 115
100
Mobile Station
Central Provider Access Network 109
Central Provider #1 Core Network 110
3G Base Station
3G BS
Virtual Service Provider Workstation Server 4910
Central Provider Service Controller 122
Internet, Data or Phone Network 120
Wi-Fi APs or Mesh 702
Wi-Fi Access CPE 704
Proxy Server/Router 270
Central Provider #2 Core Network 110
Billing Interface 122
Billing System 123
CDR Storage, Aggregation, Mediation, Feed 118
Order Management 180
Subscriber Management 182
Network Provisioning System 160
Mobile Center 132
DNS/DHCP 126
AAA Server 121

Figure 20



325

Figure 21



326

Figure 22

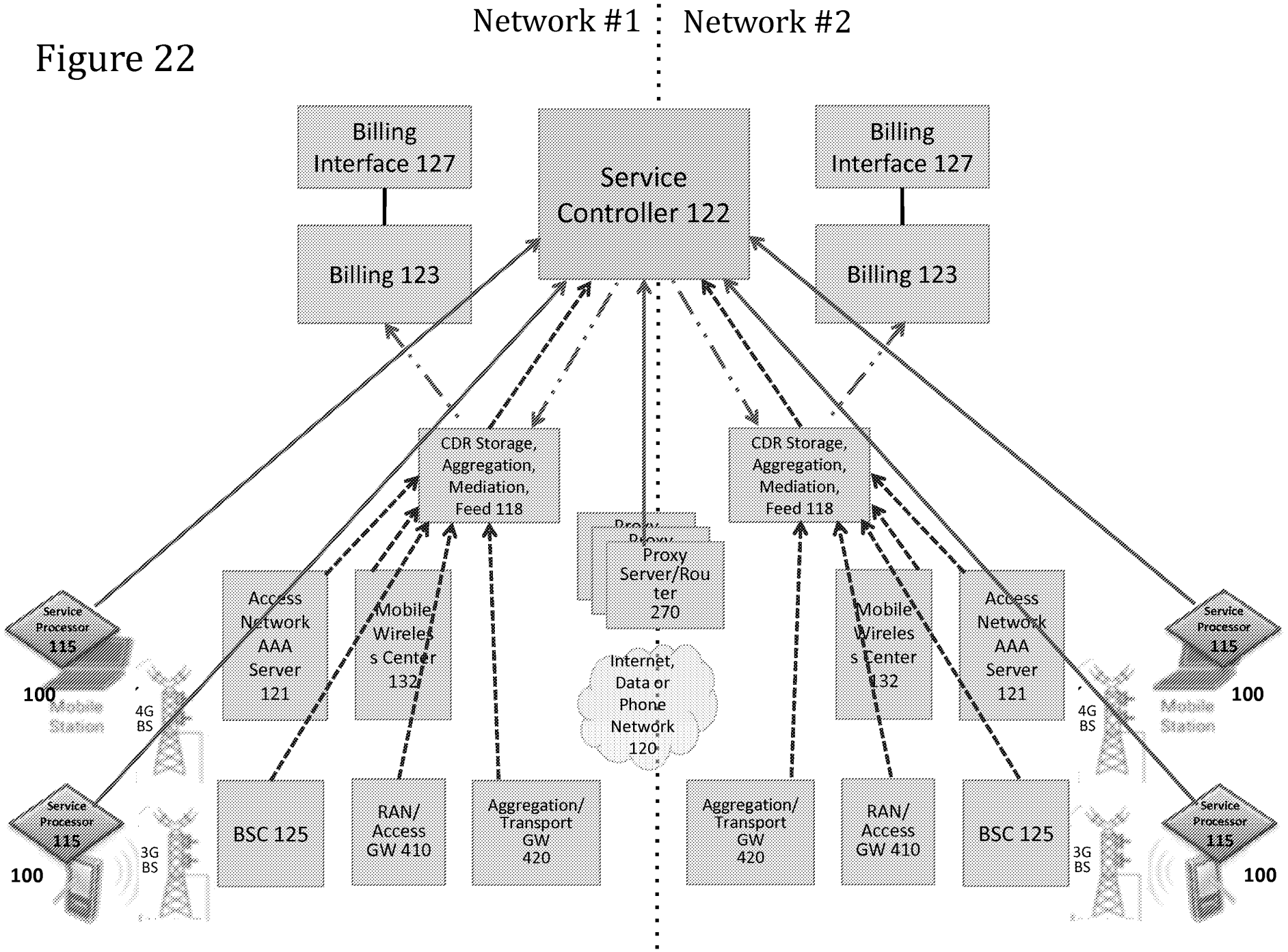
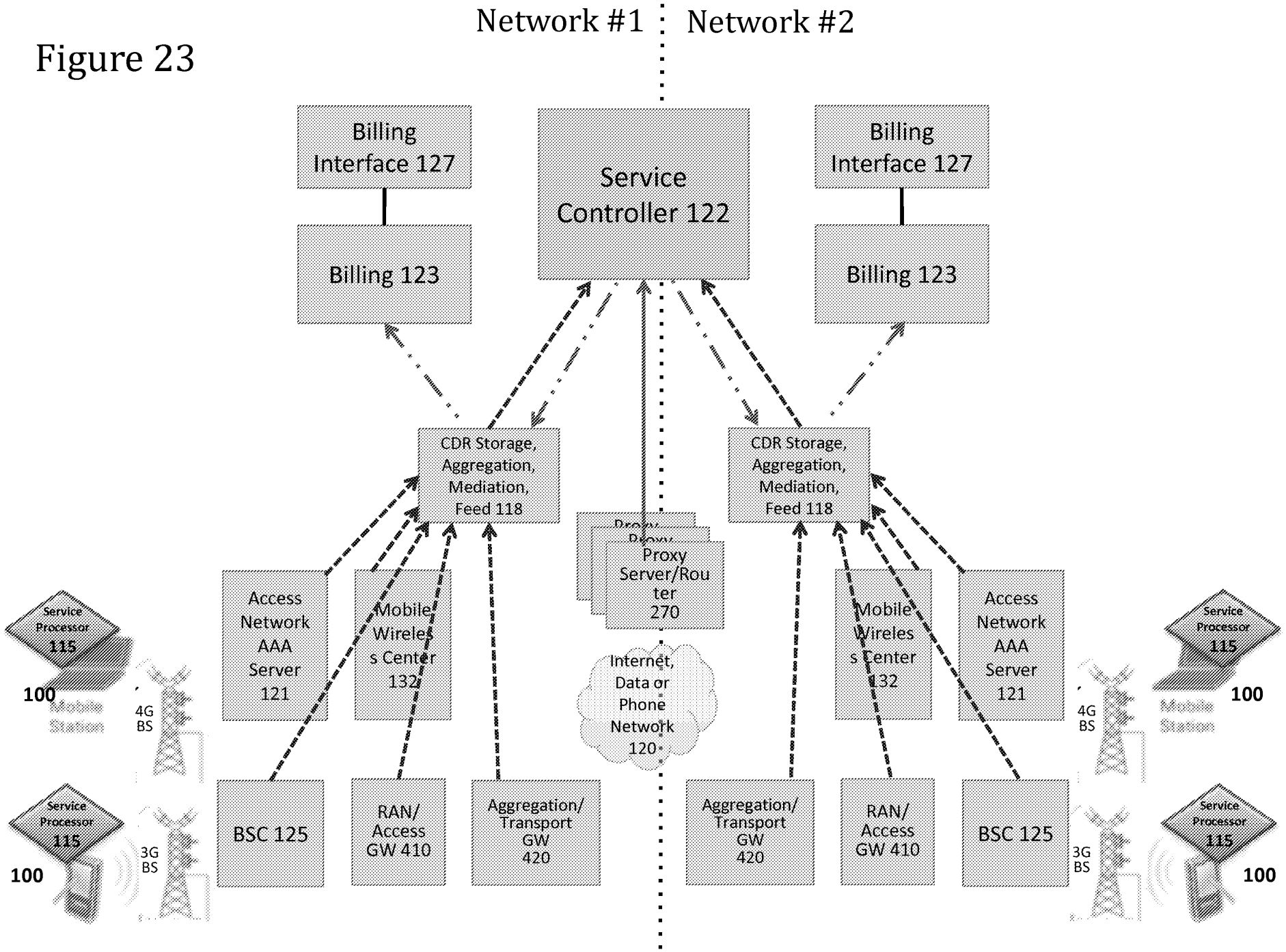

Network #1
Network #2
Billing Interface 127
Billing 123
Service Controller 122
Billing Interface 127
Billing 123
CDR Storage, Aggregation, Mediation, Feed 118
CDR Storage, Aggregation, Mediation, Feed 118
Proxy Server/Router 270
Internet, Data or Phone Network 120
Access Network AAA Server 121
Mobile Wireless Center 132
Access Network AAA Server 121
Mobile Wireless Center 132
Service Processor 115
Service Processor 115
Service Processor 115
Service Processor 115
100
100
100
100
4G BS
4G BS
3G BS
3G BS
BSC 125
RAN/ Access GW 410
Aggregation/ Transport GW 420
Aggregation/ Transport GW 420
RAN/ Access GW 410
BSC 125

Figure 23



328

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP030
	Application Number	
Title of Invention	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1 Remove

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Gregory	G.	Raleigh	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Woodside	State/Province	CA	Country of Residence [i]	US

Citizenship under 37 CFR 1.41(b) [i] US

Mailing Address of Applicant:

Address 1	2995 Woodside Road
Address 2	Suite 400

City	Woodside	State/Province	CA
Postal Code	94062	**Country** [i]	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

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For further information see 37 CFR 1.33(a).

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Customer Number	21912		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY		
Attorney Docket Number	RALEP030	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter			
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	23	**Suggested Figure for Publication (if any)**	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP030
	Application Number	
Title of Invention	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	21912		

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Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	12380780	2009-03-02
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	12695019	2010-01-27
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	12695021	2010-01-27
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61206354	2009-01-28
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61206944	2009-02-04
Prior Application Status	Pending		Remove

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP030
	Application Number	
Title of Invention	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY	

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61207393	2009-02-10
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61207739	2009-02-13
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61270353	2009-07-06
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.			Add

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Remove

Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			◉ Yes ○ No

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Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1 Remove

If the Assignee is an Organization check here. ☒

Organization Name	Headwater Partners I LLC		
Mailing Address Information:			
Address 1	2995 Woodside Road		
Address 2	Suite 400		
City	Woodside	**State/Province**	CA
Country [i]	US	Postal Code	94062
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the **Add** button. Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP030
	Application Number	
Title of Invention	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY	

Signature	/Michael J. Schallop/			Date (YYYY-MM-DD)	2010-01-28
First Name	Michael	Last Name	Schallop	Registration Number	44319

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	6905087
Application Number:	12695980
International Application Number:	
Confirmation Number:	8973
Title of Invention:	ENHANCED ROAMING SERVICES AND CONVERGED CARRIER NETWORKS WITH DEVICE ASSISTED SERVICES AND A PROXY
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	21912
Filer:	Michael J. Schallop/Veronica Pula
Filer Authorized By:	Michael J. Schallop
Attorney Docket Number:	RALEP030
Receipt Date:	28-JAN-2010
Filing Date:	
Time Stamp:	19:41:53
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		RALEP030_APP.pdf	284288 20647dd6af5fae8565c01dacfd2bc4e3826dbe39	yes	77

	Multipart Description/PDF files in .zip description				
	Document Description	**Start**	**End**		
	Transmittal of New Application	1	1		
	Specification	2	72		
	Claims	73	76		
	Abstract	77	77		
Warnings:					
Information:					
2	Drawings-only black and white line drawings	RALEP030_Figures.pdf	2860874 a21212df006f270858946148dba11578168 7a93d	no	23
Warnings:					
Information:					
3	Application Data Sheet	RALEP030_Application_Data_Sheet_sb0014_fill.pdf	965086 adb12b25cc09cf9015f8cea10089f8b5fc498 3d1	no	5
Warnings:					
Information:					
		Total Files Size (in bytes):	4110248		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

SCORE Placeholder Sheet for IFW Content

Application Number: 12695980 Document Date: 1/28/2010

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (http://es/ScoreAccessWeb/).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: February 8, 2006

PTO/SB/06 (12-04)

Date: **01/28/10**

Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: **12/695,980**

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	**330**
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	**540**
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	**220**
TOTAL CLAIMS (37 CFR 1.16(i))	**20** minus 20 =		x$26		OR	x$52	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	**1** minus 3 =	*	x$110			x$220	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $260 ($130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195			390	
			TOTAL			TOTAL	**1090**

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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