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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,021	01/01/2013	8346225	RALEP029 [26WV-160506]	7079

107265 7590 12/12/2012

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 161 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)

Substitute for form 1449/PTO				Complete if Known	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,021
				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.	RALEP029

	EEEE.	US 2008/0305793	12-11-2008	GALLAGHER et al.	
	FFFF.	US 2008/0083013	04-03-2008	SOLIMAN et al.	
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	VVVV.	US 2007/0130315	06-07-2007	FRIEND et al.	
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	BBBBB.	US 2002/0138601	09-26-2002	PIPONIUS et al.	
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	KKKKK.	US 2008/0222692	09-11-2008	ANDERSSON et al.	
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	NNNNN.	US 2007/0104126	5-10-2007	CALHOUN et al.	
	OOOOO.	US 2007/0243862	10-18-2007	COSKUN et al.	
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	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.	
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Change(s) applied to document, /A.E.G/ 11/30/2012

Change(s) applied to document, /P.M./ 11/29/2012

Change(s) applied to document, /P.M./ 11/21/2012

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.
12/695,021	01/27/2010	Gregory G. Raleigh	RALEP029 [26WV-160506]	7079

107265 7590 11/19/2012

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
11/19/2012	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patent@headwaterllc.com

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
12/695,021	27 January, 2010	RALEIGH, GREGORY G.	RALEP029 [26WV-160506]

		EXAMINER	
Headwater Partners I LLC - Outside Firm 1 350 Marine Parkway, Suite 300 Redwood Shores, CA 94065		ANDREW JOSEPH RUDY	
		ART UNIT	PAPER
		3687	20121108

DATE MAILED:

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

Commissioner for Patents

Applicant's November 2, 2012 Information Disclosure Statement (IDS) hasa 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	12695021
	Filing Date	2010-01-27
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy
	Attorney Docket Number	RALEP029

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					

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	20080085707		2008-04-10	Fadell, Tony	

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							☐

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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]

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)		
	Application Number	12695021
	Filing Date	2010-01-27
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy
	Attorney Docket Number	RALEP029

	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/Andrew Joseph Rudy/	Date Considered	11/08/2012

*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.

EFS Web 2.1.17

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

Issue Classification	Application/Control No.	Applicant(s)/Patent under Reexamination	
	12/695,021	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	414.1	370	230							
INTERNATIONAL CLASSIFICATION		709	217	224						
H 04 M	4/32									
G 06 F	15/173									
	/									
	/									
	/									

XXXXXXXXXXXXXXXXXXXXXXXXXXXX (Assistant Examiner) (Date)		Total Claims Allowed: 78
(Legal Instruments Examiner) (Date)	/Andrew Joseph Rudy/ 11/8/2012 (Primary Examiner) (Date)	O.G. Print Claim(s): 1 / O.G. Print Fig.: 2

☐ 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
1	1		31		61	59	91		121		151		181
	2		32	35	62	60	92		122		152		182
	3	17	33	36	63	61	93		123		153		183
2	4	18	34	37	64	62	94		124		154		184
	5		35	38	65	63	95		125		155		185
3	6	19	36	39	66	64	96		126		156		186
4	7	20	37	40	67	65	97		127		157		187
5	8	21	38	41	68	66	98		128		158		188
6	9	22	39	42	69	67	99		129		159		189
	10		40	43	70	68	100		130		160		190
7	11	23	41	44	71	69	101		131		161		191
8	12	24	42	45	72	70	102		132		162		192
9	13		43	46	73	71	103		133		163		193
10	14		44		74	72	104		134		164		194
11	15		45		75	73	105		135		165		195
12	16		46		76	74	106		136		166		196
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	19		49	47	79	77	109		139		169		199
	20		50	48	80	78	110		140		170		200
13	21	27	51	49	81		111		141		171		201
	22		52	50	82		112		142		172		202
	23	28	53	51	83		113		143		173		203
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	25	30	55	53	85		115		145		175		205
14	26	31	56	54	86		116		146		176		206
	27	32	57	55	87		117		147		177		207
15	28	33	58	56	88		118		148		178		208
	29	34	59	57	89		119		149		179		209
16	30		60	58	90		120		150		180		210

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

107265 7590 10/30/2012
Headwater Partners I LLC - Outside Firm 1
350 Marine Parkway, Suite 300
Redwood Shores, CA 94065

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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.

Ann Taylor (Depositor's name)
(Signature)
November 5, 2012 (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,021	01/27/2010	Gregory G. Raleigh	RALEP029 [26WV-160506]	7079

TITLE OF INVENTION: QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES

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	01/30/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
RUDY, ANDREW J	3687	705-030000

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 Krista S. Jacobsen
2 James T. Aslanis, Jr.
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: 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:
☒ 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 505876 (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).

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Authorized Signature _____ Date November 5, 2012

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

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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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner:
Gregory G. Raleigh	Andrew J. Rudy
Serial No. 12/695,021	Art Unit: 3687
Filed: January 27, 2010	Conf. No.: 7079
Title: Quality of Service for Device Assisted Services	

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: November 5, 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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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: November 5, 2012 By: _____
Ann Taylor

Electronic Patent Application Fee Transmittal				
Application Number:	12695021			
Filing Date:	27-Jan-2010			
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES			
First Named Inventor/Applicant Name:	Gregory G. Raleigh			
Filer:	Krista Susan Jacobsen/Ann Taylor			
Attorney Docket Number:	RALEP029 [26WV-160506]			
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:				
Utility Appl issue fee	2501	1	885	885
Publ. Fee- early, voluntary, or normal	1504	1	300	300

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

Electronic Acknowledgement Receipt	
EFS ID:	14155209
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029 [26WV-160506]
Receipt Date:	05-NOV-2012
Filing Date:	27-JAN-2010
Time Stamp:	20:51:53
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1185
RAM confirmation Number	7482
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	Issue Fee Payment (PTO-85B)	P029IFT.pdf	437926 82db8cc02cd745bc1b6b80e947d7a39328d0485b	no	1
Warnings:					
Information:					
2	Transmittal Letter	P029Ltr.pdf	209770 0f23ad5ab59869977a281dd4412c0cb471d8b042	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32105 cfd42ff0d45c93017aa1696f95c7626040dd4a06	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	679801		

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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.

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

PTO/SB/08a (01-10)
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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	12695021
	Filing Date	2010-01-27
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy
	Attorney Docket Number	RALEP029

U.S.PATENTS

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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	20080085707		2008-04-10	Fadell, Tony	

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							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

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]

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695021
	Filing Date	2010-01-27
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy
	Attorney Docket Number	RALEP029

	1		☐

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	12695021
	Filing Date	2010-01-27
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy
	Attorney Docket Number	RALEP029

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).

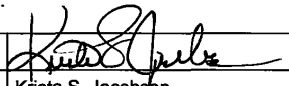
☐ See attached certification statement.

☒ 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)	2012-11-02
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.**

EFS Web 2.1.17

Electronic Patent Application Fee Transmittal	
Application Number:	12695021
Filing Date:	27-Jan-2010
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	Krista Susan Jacobsen/Ann Taylor
Attorney Docket Number:	RALEP029 [26WV-160506]
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:	14141008
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029 [26WV-160506]
Receipt Date:	02-NOV-2012
Filing Date:	27-JAN-2010
Time Stamp:	17:54:53
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	5062
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	P029Trans.pdf	300402 901ae227bda87de4881fdf6411cdc98836b9d5a8	no	1
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	P029IDS.pdf	682943 7d875664f9380a1e8661653f593a80cf934d3cbc	no	3
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Fee Worksheet (SB06)	fee-info.pdf	30362 14ffdc3ed6df89042e50061f1e4ad8ded5ef413a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1013707		

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)
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.

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission: 6

Application Number	12/695021
Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687 Conf. 7079
Examiner Name	Andrew J. Rudy
Attorney Docket Number	RALEP029

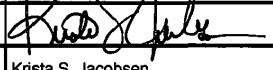
ENCLOSURES *(Check all that apply)*

- [x] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [x] 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

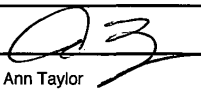
You are hereby authorized to charge any additional fee required or credit any overpayment to Deposit Account No. 50-5876.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Headwater Partners I, LLC		
Signature			
Printed name	Krista S. Jacobsen		
Date	November 2, 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	November 2, 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.**

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

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

107265 7590 10/30/2012
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: 10/30/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,021	01/27/2010	Gregory G. Raleigh	RALEP029 [26WV-160506]	7079

TITLE OF INVENTION: QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES

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	01/30/2013

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.

PTOL-85 (Rev. 02/11)

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 10/30/2012
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.
12/695,021	01/27/2010	Gregory G. Raleigh	RALEP029 [26WV-160506]	7079

TITLE OF INVENTION: QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES

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	01/30/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
RUDY, ANDREW J	3687	705-030000

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

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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,021	01/27/2010	Gregory G. Raleigh	RALEP029 [26WV-160506]	7079

107265 7590 10/30/2012

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: 10/30/2012

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 179 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 179 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)	
	12/695,021	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 *16 August 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 *1,4,6-16,21,26,28,30,33-39,41,42,47,48 and 51-100*.
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

1. Pursuant to Applicant's August 16, 2012 Amendment and REMARKS, the previous rejection is withdrawn.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Krista Jacobsen (Reg. No. 59,374) on October 22, 2012.

3. The application has been amended as follows:

1. (Currently amended) A system, comprising:

one or more modems for enabling a wireless end user communications device to communicate at least over a first wireless access network and a second wireless access network;

a processor of ~~an~~ the wireless end user communications device configured to:

determine that the wireless end user communications device is connected to the first wireless access network;

when the wireless end user communications device is connected to the first wireless access network:

facilitate a plurality of simultaneous quality-of-service (QoS) connections between the wireless end user communications device and a network system

communicatively coupled to the wireless end user communications device by the first wireless access network,

~~determine a quality of service (QoS) request for~~ associate a particular service activity of the wireless end user communications device with a particular QoS connection of the plurality of simultaneous QoS connections, ~~over a wireless network~~[;] and

assist in implementing a first traffic control configured to control attempted or successful communications associated with the particular service activity over ~~verify~~ the particular QoS ~~request for the~~ connection ~~service over the wireless network~~; and

when the wireless end user communications device is connected to the second wireless access network, assist in implementing a second traffic control configured to control attempted or successful communications associated with the particular service activity, the second traffic control being different from the first traffic control; and

[[a]] memory coupled to the processor and configured to provide the processor with instructions.

2-3. (Canceled)

4. (Currently amended) The system recited in claim 1, wherein the particular QoS connection ~~service~~ supports a first QoS level, wherein the first QoS level comprises one or more of ~~the following QoS levels:~~ conversational, streaming, interactive data, best-effort data, and background data, and wherein a second QoS connection of the plurality of simultaneous QoS connections supports a second QoS level that is not supported by the particular QoS connection.

5. (Canceled)

6. (Currently amended) The system recited in claim 1, wherein associate a particular service activity of the wireless end user communications device with a particular QoS connection of the plurality of simultaneous QoS connections ~~determine the quality of service (QoS) request~~ comprises: [[:]]

obtain [[the]] a QoS request through a QoS application programming interface (API), the QoS API comprising an interface on the wireless end user communications device configured to communicate QoS information to or from an application on the wireless end user communications device.

7. (Currently amended) The system recited in claim 1, wherein the processor is ~~further~~ configured to associate the particular service activity with the particular QoS connection at least in part by[[:]]

monitoring attempted or successful communications by the wireless end user communications device associated with ~~use of~~ the particular service activity~~; and~~

~~determine the QoS request based on the monitored use of the service~~.

8. (Currently amended) The system recited in claim [[7]] 1, wherein the processor is configured to associate the particular service activity with the particular QoS connection ~~request is determined~~ based at least in part on ~~an association between the monitored use of the service and~~ one or more of the following: an application activity, a network end point or destination, ~~a QoS channel,~~ a traffic type, a content type, and a pattern of application or QoS service activity.

9. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

assist in providing a user ~~interface~~ notification associated with the particular service activity, ~~if the QoS request is determined,~~ wherein the user notification includes one or more of the following: a confirmation of [[the]] a QoS request or a QoS communication attempt associated with the particular service activity, a confirmation for future similar QoS requests or similar QoS communication attempts associated with the particular service activity,[[;]] an indication that a first QoS level associated with the QoS request or the QoS communication attempt will be provided,[[;]] an indication that the first QoS level ~~associated with the QoS request~~ is not available or will not be provided,[[;]] an option to purchase a service level associated with the QoS request or the QoS communication attempt,[[;]] an option to upgrade to

a new service plan,[[;]] and an indication that ~~an attempted or successful~~ the particular service activity ~~of the end user communications device~~ requires or can benefit from a second QoS level.

10. (Canceled)

11. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

assist in implementing a service profile for assisting in the first traffic control of the particular service activity, ~~end user communications device's use of the service on the wireless network,~~ wherein the service profile includes one or more service policy settings for assisting in monitoring the attempted or successful communications associated with ~~use of~~ the particular service activity based on the service profile ~~and determining the QoS request based on the monitored use of the service~~; and

update the service profile based on ~~using~~ information obtained from a network element or from a service controller.

12. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

determine if the particular service activity is authorized for the particular QoS connection ~~request is authorized~~ based on a service plan associated with the wireless end user communications device, or based on a user input; and

when the particular service activity ~~QoS request~~ is not authorized for the particular QoS connection, prevent the particular service activity ~~an enablement of a~~ from using the particular QoS connection ~~channel associated with the QoS request~~.

13. (Currently amended) The system recited in claim 1, wherein the processor is configured to associate the particular service activity with the particular QoS connection of the plurality of simultaneous QoS connections at least in part by ~~verify the QoS request for the service over the wireless network comprises~~ determining[[e]] if [[the]] a QoS request or QoS

communication attempt associated with the particular service activity is authorized based on QoS rules.

14. (Currently amended) The system recited in claim 1, wherein associate a particular service activity of the wireless end user communications device with a particular QoS connection of the plurality of simultaneous QoS connections ~~verify the QoS request for the service over the wireless network~~ comprises: obtain at least an aspect of QoS rules from a service controller or a network element,

determine if [[the]] a QoS request or QoS communication attempt associated with the particular service activity is allowed based at least in part on the obtained aspect of the QoS rules; and

take an action based on the determination.

15. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

obtain at least an aspect of QoS rules from a service controller or a network element, wherein the QoS rules include a QoS activity map that associates ~~a QoS~~ the particular service activity with one or more QoS ~~service~~ levels.

16. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

determine if [[the]] a QoS request or QoS communication attempt associated with the particular service activity is authorized; and

assist in providing a user ~~interface~~ notification if the QoS request or QoS communication attempt is not authorized.

17-20. (Canceled)

21. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

determine whether a QoS request associated with the particular service activity is authorized for the particular QoS connection based on QoS rules; and

send the QoS request to an access point if the QoS request is determined to be authorized for the particular QoS connection based on the QoS rules, wherein the access point assists the processor in facilitating[[es]] [[a]] the particular QoS connection ~~session for the QoS request based on network capacity~~.

22-25. (Canceled)

26. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

send [[the]] a first QoS request associated with the particular service activity to a service controller or a network element;

receive a QoS approval authorization for the particular QoS connection of the plurality of simultaneous QoS connections from the service controller or the network element; and

send a second QoS request to a base station, wherein the second QoS request includes the QoS approval authorization ~~for one or more QoS links for a QoS channel~~.

27. (Canceled)

28. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

send [[the]] a QoS request associated with the particular service activity to a service controller, wherein the service controller assists the processor in facilitating ~~communicates with the one or more network devices to provision a~~ the particular QoS connection ~~channel, wherein the QoS channel includes one or more QoS links~~; and

obtain ~~the service controller returns~~ a QoS reservation for the particular ~~provisioned~~ QoS connection from the service controller ~~channel~~.

29. (Canceled)

30. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

~~facilitate a QoS session if the QoS request is determined to be authorized; and~~

assist in determining an accounting for usage associated with the particular service activity ~~QoS session~~.

31-32. (Canceled)

33. (Currently amended) The system recited in claim 1, wherein the processor is further configured to assist in implementing the first traffic control at least in part by[[:]] implementing a QoS router for assisting in managing one or more of the plurality of simultaneous QoS connections ~~sessions for the end user communications device~~.

34. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

assist in sending network capacity information or network congestion information to a network element or to a service controller.

35. (Canceled)

36. (Currently amended) The system recited in claim 33 [[1]], wherein ~~the processor is further configured to:~~

~~implement a QoS router for assisting in managing one or more QoS sessions for the end user communications device, and wherein~~ the QoS router is configured to assist in implementing at least one of: upgrade a QoS class or a QoS level, downgrade a QoS class or a QoS level, deallocate a QoS class or a QoS level, traffic shape a communication associated with ~~the one or more~~ one of the plurality of simultaneous QoS connections ~~sessions~~, delay a communication associated with ~~the one or more~~ one of the plurality of simultaneous QoS

connections ~~sessions~~, time window a communication associated with ~~the one or more~~ one of the plurality of simultaneous QoS connections ~~sessions~~, throttle a communication associated with ~~the one or more~~ one of the plurality of simultaneous QoS connections ~~sessions~~, queue with priority a communication associated with ~~the one or more~~ one of the plurality of simultaneous QoS connections ~~sessions~~, and block a communication associated with ~~the one or more~~ one of the plurality of simultaneous QoS connections ~~sessions~~ based on wireless network QoS availability or congestion.

37. (Currently amended) The system recited in claim 36 [[1]], wherein ~~the processor is further configured to:~~

~~implement a QoS router for assisting in managing one or more QoS sessions for the end user communications device, wherein~~ the QoS router is configured to assist in ~~implementing at least one of: upgrade a QoS class or a QoS level, downgrade a QoS class or a QoS level, deallocate a QoS class or a QoS level, traffic shape communication associated with the one or more QoS sessions, delay communication associated with the one or more QoS sessions, time window communication associated with the one or more QoS sessions, throttle communication associated with the one or more QoS sessions, queue with priority communication associated with the one or more QoS sessions, and block communication associated with the one or more QoS sessions, and wherein the QoS router assists in~~ implementing one or more of the following: a background QoS service level; a best effort service level, a QoS differentiated service level, and a QoS guaranteed service level.

38. (Currently amended) The system recited in claim 1, wherein the particular service activity is a first service activity, and wherein the particular QoS connection is a first QoS connection ~~processor is further configured to:~~

~~assist in managing a plurality of QoS sessions using a QoS router, wherein a QoS class is associated with each QoS session; and wherein the QoS router is configured to assist in passing, routing, directing, queuing or tunneling a first QoS service activity over a first QoS channel, the first QoS channel~~ associated with a first QoS class, and wherein the processor ~~QoS router~~ is further configured to assist in passing, blocking, controlling, throttling, delaying,

deferring, routing, directing, priority queuing, forwarding, or tunneling attempted or successful communications associated with a second ~~QoS~~ service activity over a second QoS connection ~~channel~~ of the plurality of simultaneous QoS connections, wherein the second QoS connection ~~channel~~ is associated with a second QoS class.

39. (Currently amended) The system recited in claim 33 [[1]], wherein the processor is further configured to[[:]]

~~receive~~ obtain network QoS information from a network element, a base station or a service controller, the network QoS information comprising one or more of network capacity information, network congestion information, QoS availability information and a QoS policy,[[;]] and

wherein implementing the [[a]] QoS router comprises using ~~for assisting in managing one or more QoS sessions for the end user communications device based on~~ the received network QoS information.

40. (Canceled)

41. (Currently amended) The system recited in claim 33 [[1]], wherein the processor is further configured to:

~~implement a QoS router, wherein the user is~~ offer[[ed]], to a user, a choice of whether ~~or not~~ to allow the QoS router to dynamically manage QoS of one or more ~~and/or non-QoS~~ service[[s]] activities available to the wireless end user communications device.

42. (Currently amended) The system recited in claim 1, wherein the processor is further configured to:

assist in determining a service usage accounting for the particular [[a]] QoS connection ~~session~~, wherein the service usage accounting is determined based at least in part on one or more of the following: a QoS[[s]] level, a QoS class, a traffic priority level, a network type, an allocated network bandwidth, a QoS priority, and a radio access bearer (RAB) type.

43-46. (Canceled)

47. (Currently amended) A method performed by one or more processors in a[[n]] wireless end user communications device configured to communicate at least over a first wireless access network and a second wireless access network, the method comprising:

determining that the wireless end user communications device is connected to the first wireless access network;

when the wireless end user communications device is connected to the first wireless access network:

facilitating a plurality of simultaneous quality-of-service (QoS) connections between the wireless end user communications device and a network system communicatively coupled to the wireless end user communications device by the first wireless access network;

~~determining~~ associating a particular service activity of the wireless end user communications device with a particular QoS connection of the plurality of simultaneous QoS connections ~~quality of service (QoS) request for a service over a wireless network~~; and

~~verifying~~ assisting in implementing a first traffic control configured to control attempted or successful communications over the particular QoS connection that is associated with the particular service activity; and ~~request for the service over the wireless network~~

when the wireless end user communications device is connected to the second wireless access network, assist in implementing a second traffic control configured to control attempted or successful communications associated with the particular service activity over the second wireless access network, the second traffic control being different from the first traffic control.

48. (Currently amended) A computer program product, the computer program product being embodied in a non-transitory computer readable storage medium and comprising computer instructions executed in one or more processors of a[[n]] wireless end user communications

device configured to communicate at least over a first wireless access network and a second wireless access network, the computer instructions for:

determining that the wireless end user communications device is connected to the first wireless access network;

when the wireless end user communications device is connected to the first wireless access network:

facilitating a plurality of simultaneous quality-of-service (QoS) connections between the wireless end user communications device and a network system communicatively coupled to the wireless end user communications device by the first wireless access network;

~~determining~~ associating a particular service activity of the wireless end user communications device with a particular QoS connection of the plurality of simultaneous QoS connections ~~quality of service (QoS) request for a service over a wireless network~~; and

~~verifying~~ assisting in implementing a first traffic control configured to control attempted or successful communications over the particular QoS connection that is associated with the particular service activity; and ~~request for the service over the wireless network~~

when the wireless end user communications device is connected to the second wireless access network, assist in implementing a second traffic control configured to control attempted or successful communications associated with the particular service activity over the second wireless access network, the second traffic control being different from the first traffic control.

49-50. (Canceled)

51. (Currently amended) The system recited in claim 13, wherein the QoS rules are associated with a service plan for the wireless end user communications device.

52. (Canceled)

53. (Currently amended) The system recited in claim 13, wherein the processor of the wireless end user communications device is further configured to:

assist in providing a user notification through a user interface of the wireless end user communications device, the user notification describing an aspect of the QoS rules.

54. (Currently amended) The system recited in claim 14, wherein the action comprises one or more of: assist to establish [[a]] the particular QoS connection ~~channel~~; assist to provide a QoS level; forward information about the QoS request or QoS communication attempt to a network element or to a service controller; assist to deny the particular QoS connection ~~channel~~; assist to deny the QoS level; decline to forward information about the QoS request or QoS communication attempt to the network element or to the service controller; and assist in providing a user interface notification associated with the QoS request or QoS communication attempt.

55. (Currently amended) The system recited in claim 1 [[15]], wherein the ~~QoS~~ particular service activity comprises an attempted or successful network access associated with one or more of the following: an application, a network destination, a network source, a network end point, a uniform resource locator (URL), a website, a network server, a particular service provider, a particular network type, a traffic type, a content type, a network protocol, a traffic session type, a QoS identifier, a time of day, a state of network capacity, a network busy state, a user service plan authorization or standing, a roaming or home network status, voice-over-Internet-protocol (VOIP) traffic, streaming video traffic, differentiated access bandwidth during busy network periods, real-time interactive traffic, communications that include network connected multimedia meetings, communications that include shared presentations, communications that include pictures, communications that include videos, communications that include voice, Internet browsing, short message service (SMS) or push to talk, email message body delivery, email attachment delivery, communications associated with background download services, communications associated with email downloads or other file transfers, communications associated with file transfer protocol (FTP), communications taking place when the user is not interacting with an application that is communicating with the network,

communications associated with software updates, communications associated with a best effort QoS level,[[;]] communications associated with an interactive QoS level, communications associated with a QoS level for time sensitive services, communications associated with a guaranteed bit rate QoS level, communications associated with a near real time or interactive QoS level, and communications associated with a background QoS level.

56. (Currently amended) The system recited in claim 1 [[15]] wherein the ~~QoS~~ particular service activity comprises attempted or successful communications associated with an application ~~running~~ on the wireless end user communications device.

57. (Currently amended) The system recited in claim 15 [[56]], wherein the one or more QoS ~~service~~ levels comprise a background service level,[[;]] and wherein the processor is further configured to assist in implementing the first traffic control by implementing a QoS policy associated with the background service level.

58. (Currently amended) The system recited in claim 15, wherein the particular service activity comprises attempted or successful communications associated with an application on the wireless end user communications device, and wherein the one or more QoS ~~service~~ levels comprise a background service level,[[;]] and wherein the processor is further configured to assist in implementing a QoS policy associated with the background service level.

59. (Currently amended) The system recited in claim 16, wherein the user notification includes one or more of the following: information about a denial of the QoS request or QoS communication attempt, information explaining a reason[[(s)]] for a denial of the QoS request or QoS communications attempt, an option to purchase a new service level for the QoS request or QoS communication attempt, and an option to upgrade to a new service plan.

60-61. (Canceled)

62. (Currently amended) The system recited in claim 38, wherein the first QoS connection ~~channel~~ or the second QoS connection ~~channel~~ is one or more of a prioritized traffic queue, ~~and~~ a radio access bearer, a QoS channel, and a QoS session.

63. (Currently amended) The system recited in claim 33 [[39]], wherein assisting in managing one or more of the plurality of simultaneous QoS connections ~~sessions for the end user communications device~~ comprises assisting in [[to]] implementing one or more traffic shaping parameters for the one or more of the plurality of simultaneous QoS connections ~~sessions~~.

64. (Currently amended) The system recited in claim 1, wherein ~~determine the quality of service (QoS) request for the service over the wireless network~~ associate a particular service activity of the wireless end user communications device with a particular QoS connection of the plurality of simultaneous QoS connections comprises identify an attempted or successful traffic flow associated with a particular QoS level, the attempted or successful traffic flow comprising one or more related data transfers.

65. (Currently amended) The system recited in claim 64, wherein identify the attempted or successful traffic flow comprises tag the attempted or successful flow to preserve an association between the attempted or successful traffic flow and an application on the wireless end user communication device when the attempted or successful traffic flow is processed by one or more operations on the wireless end user communications device.

66. (Currently amended) The system recited in claim 64, wherein identify the attempted or successful traffic flow comprises tag the attempted or successful traffic flow to preserve an association between the attempted or successful traffic flow and a traffic type when the attempted or successful traffic flow is processed by one or more operations on the wireless end user communications device.

67. (Currently amended) The system recited in claim 64, wherein identify the attempted or successful traffic flow comprises tag the attempted or successful traffic flow to preserve an

association between the attempted or successful traffic flow and a network endpoint or network destination when the attempted or successful traffic flow is processed by one or more operations on the wireless end user communications device.

68. (Currently amended) The system recited in claim 64, wherein identify the attempted or successful traffic flow comprises tag the attempted or successful traffic flow to preserve an association between the attempted or successful traffic flow and a traffic route, a traffic re-direction, a traffic tunnel, [[a]] the particular QoS connection ~~channel~~, a radio access bearer, a QoS channel, a QoS session, or a logical channel when the attempted or successful traffic flow is processed by one or more operations on the wireless end user communications device.

69. (Currently amended) The system recited in claim 1, wherein the processor is further configured to provide a QoS application programming interface (API), the QoS API comprising an interface on the wireless end user communications device for communicating QoS information to or from an application on the wireless end user communications device.

70. (Previously presented) The system recited in claim 69, wherein the QoS information communicated to or from the application comprises information to inform the application of at least one of an available QoS level, a level of network congestion, an available data rate, an available bandwidth, and an available communication performance level.

71. (Currently amended) The system recited in claim 69, wherein the QoS information communicated to or from the application comprises information to inform the application of one or more networks to which the wireless end user communications device is connected or is capable of being connected.

72. (Currently amended) The system recited in claim 69, wherein the QoS information communicated to or from the application comprises information enabling the application to request or establish a level of QoS, a first QoS connection of the plurality of simultaneous QoS connections, ~~channel or~~ a QoS enabled radio access bearer, a QoS channel, or a QoS session.

73. (Currently amended) The system recited in claim 1, wherein associate a particular service activity of the wireless end user communications device with a particular QoS connection ~~determine the quality of service (QoS) request for the service over the wireless network~~ comprises:

identify an attempted or successful ~~QoS~~ communication associated with the particular service activity, and

associate the identified attempted or successful communication ~~QoS service activity~~ with a QoS level based on ~~the identified attempted or successful QoS service activity and on~~ a QoS activity map.

74-78. (Canceled)

79. (Currently amended) The system recited in claim 1, wherein associate a particular service activity of the wireless end user communications device with a particular QoS connection of the plurality of simultaneous QoS connections ~~determine the quality of service (QoS) request for the service over the wireless network~~ comprises identify a QoS rule for an attempted or successful communication associated with the particular service ~~usage~~ activity ~~by the end user communications device~~, and wherein ~~the processor of the end user communications device is further configured to~~ assist in implementing a first traffic control comprises implement the QoS rule ~~using a QoS router function~~.

80. (Currently amended) The system recited in claim 79, wherein the QoS rule ~~comprises~~ directs the processor to pass, block, control, throttle, delay, defer, direct, [[to]] route, forward, tunnel, or priority queue ~~to re-direct~~ a traffic flow associated with the attempted or successful communication ~~service usage activity~~ to one or more of a device QoS processing queue, the particular [[a]] QoS connection ~~channel~~, a particular radio access bearer, a particular QoS channel, a particular QoS session, a particular network tunnel, a particular network logical channel, and a particular network end point.

81. (Currently amended) The system recited in claim 79, wherein identify the QoS rule for the attempted or successful communication ~~service usage activity by the end user communications device~~ comprises:

monitor the attempted or successful communication ~~service usage activity~~; and

identify the QoS rule based on ~~information from~~ the monitored[[ing]] attempted or successful communication.

82. (Previously presented) The system recited in claim 79, wherein the QoS rule is identified based on a QoS mapping associated with one or more of a particular application, a particular network destination or end point, a particular traffic type, a network QoS availability level, a network congestion level and a network type.

83. (Currently amended) The system recited in claim 79, wherein ~~the processor of the end user communications device is further configured to assist in~~ implement[[ing]] the QoS rule comprises ~~by~~ pass, block, control, throttle, delay[[ing]], defer[[ring]], direct, route, forward, tunnel, or ~~time windowing,~~ priority queue[[ing]]~~, prioritizing, throttling, or traffic shaping one or more communications associated with~~ the attempted or successful communication ~~service usage activity~~.

84. (Currently amended) The system recited in claim 79, wherein the processor of the wireless end user communications device is further configured to obtain an update for at least an aspect of the QoS rule from a network element or a service controller.

85. (Currently amended) The system recited in claim 1, wherein assist in implementing a first traffic control ~~determine the quality of service (QoS) request for the service over the wireless network~~ comprises:

~~determine~~ obtain a first QoS rule associated with a first attempted or successful communication associated with the particular service ~~usage~~ activity ~~by the end user communications device,~~[[;]] and

implement the first QoS rule,

and wherein the processor is further configured to:

~~determine~~ apply a second QoS rule associated with a second attempted or successful communication associated with a second service ~~usage~~ activity ~~by the end user communications device,~~[[;]] and

~~wherein the processor of the end user communications device is further configured to assist in~~ implement[[ing]] the ~~first QoS rule and the~~ second QoS rule ~~using a QoS router function~~.

86. (Currently amended) The system recited in claim 85, wherein the second QoS rule differs from the first QoS rule, and wherein the first QoS rule [[is]] directs the processor to pass, block, control, throttle, delay, defer, direct, [[to]] route, forward, tunnel, or priority queue ~~or to re-direct~~ a traffic flow associated with the first attempted or successful communication ~~service usage activity~~ to one or more of a device QoS processing queue, [[a]] the particular QoS connection ~~channel~~, a particular radio access bearer, a particular QoS channel, a particular QoS session, a particular network tunnel, a particular network logical channel, and a particular network end point~~; and the second QoS rule differs from the first QoS rule~~.

87. (Currently amended) The system recited in claim 85, wherein the first QoS rule is obtained ~~determined~~ based on monitoring the first attempted or successful communication ~~service usage activity and determining the first QoS rule based on information from the monitoring, and the second QoS rule is determined based on monitoring the second attempted or successful service usage activity~~.

88. (Currently amended) The system recited in claim 85, wherein the first QoS rule is obtained ~~determined~~ based on a first QoS mapping for a ~~first~~ particular application, a particular network destination or end point, a particular traffic type, a network QoS availability level, a network congestion level, or a network type ~~and the second QoS rule is determined based on a second QoS mapping for a second particular application~~.

89. (Currently amended) The system recited in claim 85, wherein the first QoS rule is ~~determined~~ obtained based on information obtained with the assistance of a QoS application programming interface (API), the QoS API comprising an interface on the wireless end user communications device for communicating QoS information to or from an application on the wireless end user communications device.

90. (Currently amended) The system recited in claim 85, wherein the first QoS rule is obtained ~~determined~~ based on first information obtained from a first application with the assistance of a QoS application programming interface (API), and the second QoS rule is determined based on second information obtained from a second application with the assistance of the QoS API, the QoS API comprising an interface on the wireless end user communications device for communicating QoS information to or from the first and second applications.

91. (Currently amended) The system recited in claim 85, wherein ~~processor in the end user communications device is further configured, based on~~ the first QoS rule[[,]] directs the processor to assist in delaying, deferring, time windowing, queuing, prioritizing, throttling, or traffic shaping ~~one or more communications associated with~~ the first attempted or successful communication ~~service usage activity;~~ and~~, based on~~ the second QoS rule[[,]] directs the processor to assist in ~~delaying, deferring, time windowing, queuing, prioritizing, throttling, or traffic shaping~~ allowing or not interfering with one or more communications associated with the second ~~attempted of successful~~ service ~~usage~~ activity.

92. (Currently amended) The system recited in claim 85, wherein the processor of the wireless end user communications device is further configured to obtain an update for at least an aspect of the first QoS rule from a network element or a service controller.

93. (Currently amended) The system recited in claim 1, wherein the particular service activity is a first service activity, and wherein the particular QoS connection ~~request for the service over the wireless network~~ is a first QoS connection, ~~request for a first service over the wireless network~~ and wherein the processor is further configured to:

~~determine~~ associate a second service activity with a second QoS connection of the plurality of simultaneous QoS connections ~~request for a second service over the wireless network~~; and

assist in implementing a third traffic control configured to control attempted or successful communications associated with the second service activity over the second QoS connection ~~simultaneously providing a first QoS level for the first service and a second QoS level for the second service, wherein the first QoS level differs from the second QoS level~~.

94. (Currently amended) The system recited in claim 1, wherein the processor is further configured to obtain at least an aspect of a QoS activity map from a user interface, the QoS activity map providing an association of [[a QoS]] the particular service activity with one or more QoS ~~service~~ levels,[[;]] and wherein ~~determine~~ associate the particular service activity of the wireless end user communications device with the particular QoS connection of the plurality of simultaneous QoS connections ~~the quality of service (QoS) request for the service over the wireless network~~ comprises ~~monitor use of the service and~~ identify an attempted or successful communication associated with the ~~QoS~~ particular service activity and associate the identified attempted or successful communication with a particular QoS level of the one or more QoS levels,[[;]] and wherein assist in implementing the first traffic control ~~verify the QoS request for the service over the wireless network~~ comprises obtain a QoS rule from the QoS activity map and apply the QoS rule~~, the QoS rule configured~~ to assist in implementing the ~~one or more~~ particular QoS ~~service~~ level[[s]] for the attempted or successful communication associated with the particular ~~QoS~~ service activity.

95. (Currently amended) The system of claim 94, wherein the particular ~~QoS~~ service activity comprises an attempted or successful network access associated with one or more of the following: an application, a network destination, a network source, a network end point, a uniform resource locator (URL), a website, a network server, a particular service provider, a particular network type, a traffic type, a content type, a network protocol, a traffic session type, a QoS identifier, a time of day, a state of network capacity, a network busy state, a user service plan authorization or standing, a roaming or home network status, voice-over-Internet-protocol

(VOIP) traffic, streaming video traffic, differentiated access bandwidth during busy network periods, real-time interactive traffic, communications that include network connected multimedia meetings, communications that include shared presentations, communications that include pictures, communications that include videos, communications that include voice, Internet browsing, short message service (SMS) or push to talk, email message body delivery, email attachment delivery, communications associated with background download services, communications associated with email downloads or other file transfers, communications associated with file transfer program (FTP), communications taking place when the user is not interacting with an application that is communicating with the network, communications associated with software updates, communications associated with a best effort QoS level, communications associated with an interactive QoS level, communications associated with a QoS level for time sensitive services, communications associated with a guaranteed bit rate QoS level, communications associated with a near real time or interactive QoS level, and communications associated with a background QoS level.

96. (Currently amended) The system recited in claim 94, wherein the particular ~~QoS~~ service activity comprises attempted or successful communications associated with an application ~~running~~ on the wireless end user communications device.

97. (Currently amended) The system recited in claim 94, wherein the one or more QoS ~~service~~ levels comprise[[s]] a background service level.

98. (Currently amended) The system recited in claim 94, wherein the particular ~~QoS~~ service activity comprises an attempted or successful communication associated with an application ~~running~~ on the wireless end user communications device, and the one or more QoS ~~service~~ levels comprise[[s]] a background service level.

99. (New) The system recited in claim 1, wherein the particular service activity is a background access associated with a particular application on the wireless end user communications device, and wherein the processor is further configured to obtain a user input

specifying to block the background access associated with the particular application, and wherein assist in implementing a first traffic control comprises blocking the background access.

100. (New) The system recited in claim 94, wherein the one or more QoS levels comprise a background service level, and wherein the processor is further configured to assist in implementing the first traffic control by implementing a QoS policy associated with the background service level.

101. (New) The system recited in claim 1, wherein the first traffic control comprises one or more of allowing, blocking, throttling, delaying, deferring, directing, routing, forwarding, tunneling, and priority queuing the particular service activity.

102. (New) The system recited in claim 1, wherein the second traffic control comprises allowing the particular service activity.

103. (New) The system recited in claim 1, wherein at least one of the first traffic control and the second traffic control is based on a user preference.

104. (New) The system recited in claim 1, wherein the first traffic control comprises blocking or restricting the attempted or successful communications associated with the particular service activity, and the second traffic control comprises allowing or not interfering with the attempted or successful communications associated with the particular service activity.

105. (New) The system recited in claim 104, wherein the first wireless access network is a cellular network, and the second wireless access network is a wireless fidelity (WiFi) network.

106. (New) The system recited in claim 104, wherein the first wireless access network is a roaming network, and the second wireless access network is a home network.

107. (New) The system recited in claim 104, wherein the particular service activity comprises a background activity.

108. (New) The system recited in claim 1, wherein the first wireless access network is associated with a first cost, and the second wireless access network is associated with a second cost, the first cost being larger than the second cost.

109. (New) The system recited in claim 108, wherein the first traffic control comprises blocking or restricting the attempted or successful communications associated with the particular service activity.

110. (New) The system recited in claim 1, wherein the processor is configured to assist in implementing the first traffic control by assisting in controlling a first QoS, and wherein the processor is configured to assist in implementing the second traffic control by assisting in controlling a second QoS.

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

5. Applicant's Information Disclosure Statements (IDS's) submitted August 13, 2012 and October 10, 2012 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 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. 12/695,021	Applicant(s)/Patent Under Reexamination RALEIGH, GREGORY G.	
	Examiner ANDREW JOSEPH RUDY	Art Unit 3687	Page 1 of 1

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent under Reexamination	
	12/695,021	RALEIGH, GREGORY G.	
	Examiner	Art Unit	
	ANDREW JOSEPH RUDY	3687	

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Class	Subclass	Date	Examiner
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SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
Continuity data reviewed.	10/22/2012	AJR
Inventor name search conducted.	10/22/2012	AJR
Bibliographic data sheet reviewed.	10/22/2012	AJR

Issue Classification	Application/Control No.	Applicant(s)/Patent under Reexamination	
	12/695,021	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	414.1	370	230							
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H 04 M	4/32									
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XXXXXXXXXXXXXXXXXXXXXX (Assistant Examiner) (Date)		Total Claims Allowed: 78
(Legal Instruments Examiner) (Date)	/Andrew Joseph Rudy/ 10/22/2012 (Primary Examiner) (Date)	O.G. Print Claim(s): 1 / O.G. Print Fig.: 2

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

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37	26	44	56	70	86		116		146		176		206
	27	45	57	71	87		117		147		177		207
28	28	46	58	72	88		118		148		178		208
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Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
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Application Number	12695021
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First Named Inventor	Raleigh, Gregory G.
Art Unit	3687
Examiner Name	Rudy, Andrew J.
Attorney Docket Number	RALEP029

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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	/Andrew Joseph Rudy/	Date Considered	10/19/2012

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	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP029

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	Attorney Docket Number	RALEP029

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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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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	RALEP029

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	Attorney Docket Number	RALEP029

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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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	Attorney Docket Number	RALEP029

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	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP029

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	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP029

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	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP029

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	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP029

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	2	20080132201		2008-06-05	Karlberg, Johan	
	3	20080081606		2008-04-03	Cole, Terry L.	
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	Attorney Docket Number	RALEP029

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	Art Unit	3687
	Examiner Name	Rudy, Andrew J.
	Attorney Docket Number	RALEP029

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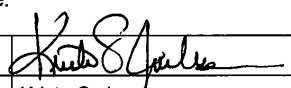
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☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

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Name/Print	Krista S. Jacobsen	Registration Number	59374

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Filing Date:	27-Jan-2010				
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES				
First Named Inventor/Applicant Name:	Gregory G. Raleigh				
Filer:	Krista Susan Jacobsen/Ann Taylor				
Attorney Docket Number:	RALEP029 [26WV-160506]				
Filed as Small Entity					
Utility under 35 USC 111(a) Filing Fees					
Description		**Fee Code**	**Quantity**	**Amount**	**Sub-Total in USD($)**
Basic Filing:					
Pages:					
Claims:					
Miscellaneous-Filing:					
Petition:					
Patent-Appeals-and-Interference:					
Post-Allowance-and-Post-Issuance:					
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Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

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EFS ID:	13946767
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029 [26WV-160506]
Receipt Date:	10-OCT-2012
Filing Date:	27-JAN-2010
Time Stamp:	01:11:38
Application Type:	Utility under 35 USC 111(a)

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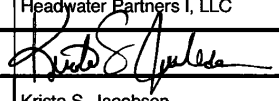
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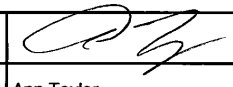
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: RALEIGH, Gregory G.	Examiner: RUDY, ANDREW J
Application No.: 12/695,021	Art Unit: 3687
Filed: 01/27/2010	Confirmation No.: 7079
Title: QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES	

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
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AMENDMENT A

Dear Sir:

In response to the Office Action dated February 16 2012, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims that begins on page 2 of this paper.

Remarks/Arguments begin on page 19 of this paper.

The following listing of claims will replace all previous versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A system, comprising:

a processor of a**n end user** communications device configured to:

determine a quality of service (QoS) request for a service over a wireless network; and

verify the QoS request for the service over the wireless network;

a memory coupled to the processor and configured to provide the processor with instructions.

2. (Currently Amended) The system recited in claim 1, wherein the **end user** communications device is a mobile communications device or an intermediate networking device, and the service includes one or more Internet based services.

3. (Canceled)

4. (Currently Amended) The system recited in claim 1, wherein the service supports one or more of the following ~~**service**~~ **QoS** levels: conversational, streaming, interactive data, and background data.

5. (Canceled)

6. (Currently Amended) The system recited in claim 1, wherein **determine the quality of service (QoS) request comprises:** ~~**the processor is further configured to**~~:

~~**receive**~~ **obtain** the QoS request through a QoS application programming interface (API)**, the QoS API comprising an interface on the end user communications device configured to communicate QoS information to or from an application on the end user communications device**.

7. (Original) The system recited in claim 1, wherein the processor is further configured to:

monitor use of the service; and

determine the QoS request based on the monitored use of the service.

8. (Currently Amended) The system recited in claim **[[1]]** 7, ~~**wherein the processor is further configured to:**~~

~~**monitor use of the service using a service processor; and**~~

~~**determine the QoS request based on the monitored use of the service,**~~ wherein the QoS request is determined based on **an association between the monitored use of the service and** one or more of the following: an application activity, **a network end point or destination, a QoS channel, a traffic type, a content type** ~~**a service activity**~~, and a pattern of application or **QoS** service activity.

9. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

~~**monitor use of the service using a service processor;**~~

~~**determine the QoS request based on the monitored use of the service; and**~~

~~**execute**~~ **assist in providing** a user interface notification if the QoS request is determined, wherein the user notification includes one or more of the following: a confirmation of the QoS request, a ~~**global**~~ confirmation for ~~**the QoS request and potential**~~ future similar ~~**types of**~~ QoS requests; **an indication that a QoS level associated with the QoS request will be provided; an indication that the QoS level associated with the QoS request is not available or will not be provided;** an option to purchase a ~~**new**~~ service level ~~**for**~~ **associated with** the QoS request~~**;, and**~~ an option to upgrade to a new service plan**; and an indication that an attempted or successful service activity of the end user communications device requires or can benefit from a QoS level**.

10. (Currently Amended) The system recited in claim 1, wherein ~~**the processor is further configured to:**~~ **determine the quality of service (QoS) request for the service over the wireless network comprises** monitor use of the service to determine an incoming QoS request or an outgoing QoS request.

11. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

assist in implement**ing** a service profile for assisting control of the **end user** communications device**'s** use of the service on the wireless network, wherein the service profile includes ~~**a plurality of**~~ **one or more** service policy settings **for assisting in**~~**, and wherein the**~~

~~service profile is associated with a service plan that specifies access to the service;~~ monitor**ing** use of the service based on the service profile**[[;]]** and determin**[[e]]ing** the QoS request based on the monitored use of the service**; and**

update the service profile using information obtained from a network element or from a service controller.

12. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

determine if the QoS request is authorized based on a service plan associated with the **end user** communications device**; and**

when the QoS request is not authorized, prevent an enablement of a QoS channel associated with the QoS request.

13. (Currently Amended) The system recited in claim 1, wherein ~~the processor is further configured to:~~ **verify the QoS request for the service over the wireless network comprises** determine if the QoS request is authorized based on ~~verified~~ QoS ~~access~~ rules~~, wherein the verified QoS access rules are associated with a service plan for the communications device~~.

14. (Currently Amended) The system recited in claim 1, wherein ~~the processor is further configured to:~~ **verify the QoS request for the service over the wireless network comprises:**

obtain an aspect of ~~receive~~ QoS ~~access~~ rules from a service controller **or a network element**,

determine if the QoS request is allowed based at least in part on the obtained aspect of the QoS rules; and

take an action based on the determination ~~wherein the QoS access rules are associated with a service plan for the communications device~~.

15. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

~~receive~~ **obtain an aspect of** QoS ~~access~~ rules from a service controller **or a network element**, wherein the QoS ~~access~~ rules include a QoS activity map that associates **a QoS** service **activity** ~~usage and/or application usage~~ with one or more QoS **service levels** ~~classes~~.

16. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

determine if the QoS request is authorized ~~based on verified QoS access rules~~; and

~~execute~~ **assist in providing** a user interface notification if the QoS request is not authorized~~, wherein the user notification includes one or more of the following: a denial of the QoS request, information explaining reason(s) for a denial of the QoS request, an option to purchase a new service level for the QoS request, and an option to upgrade to a new service plan~~.

17-20. (Canceled)

21. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to an access point if the QoS request is determined to be authorized based on ~~verified~~ QoS ~~access~~ rules, wherein the access point facilitates a QoS session for the QoS request based on network capacity.

22-25. (Canceled)

26. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to a service controller **or a network element**;

receive a QoS approval authorization from the service controller **or the network element** ~~if the QoS request is determined to be authorized and network capacity is determined to be available for the QoS request~~; **and**

send ~~the~~ **a second** QoS request to a base station, wherein the ~~approved~~ **second** QoS request includes the QoS approval authorization for one or more QoS links for a QoS channel.

27. (Canceled)

28. (Original) The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to a service controller, wherein the service controller communicates with the one or more network devices to provision a QoS channel, wherein the QoS channel includes one or more QoS links; and

the service controller returns a QoS reservation for the provisioned QoS channel.

29. (Canceled)

30. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

facilitate a QoS session if the QoS request is determined to be authorized; and

assist in determin**[[e]]ing** ~~**charging**~~ **accounting** for the QoS session.

31. (Canceled)

32. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

facilitate a plurality of QoS channels or sessions; and

assist in a QoS routing, the QoS routing configured to pass, direct, route, forward, tunnel or queue each of a plurality of service activities to at least one of the plurality of QoS channels or sessions ~~**determine charging for each of the plurality of QoS sessions, wherein the charging for each of the plurality of QoS sessions is periodically verified at least in part using network-based charging information**~~.

33. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

~~**execute**~~ **implement** a QoS router for ~~**dynamically**~~ **assisting in** managing one or more QoS sessions for the **end user** communications device.

34. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

~~**execute a QoS router for dynamically managing one or more QoS channels for the communications device; and**~~

send network capacity information **or network congestion information** to a **network element or to a** service controller~~**, wherein the service controller provides a policy decision**~~

~~point for QoS management for a plurality of communications devices in communication with one or more base stations~~.

35. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

~~execute a QoS router for dynamically managing one or more QoS channels for the communications device;~~

~~send network capacity information to a service controller, wherein the service controller provides a policy decision point for QoS management for a plurality of communications devices in communication with one or more base stations; and~~

receive QoS ~~router throttling instructions~~ **policy information** from ~~the~~ **a** service controller, wherein the service controller provides the QoS ~~router~~ **policy information** ~~throttling instructions~~ to assist in dynamically manag**[[e]]ing** network capacity for ~~the~~ **a** plurality of **end user** communications devices in communication with ~~the~~ one or more base stations**; and**

utilize the QoS policy information to perform an action that assists in managing a plurality of QoS sessions.

36. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

~~execute~~ **implement** a QoS router for ~~dynamically~~ **assisting in** managing one or more QoS sessions ~~and one or more non-QoS sessions~~ for the **end user** communications device, and wherein the QoS router **is configured to assist in implementing at least one of:** upgrade**[[s]]** **a** QoS class**[[es]]** **or a QoS level**, downgrade**[[s]]** **a** QoS class**[[es]]** **or a QoS level**, deallocate**[[s]]** **a** QoS class**[[es]]** **or a QoS level, traffic shape communication associated with the one or more QoS sessions, delay communication associated with the one or more QoS sessions, time window communication associated with the one or more QoS sessions, throttle communication associated with the one or more QoS sessions, queue with priority communication associated with the one or more QoS sessions, and block communication associated with the one or more QoS sessions** ~~and/or throttles service level usage for one or more QoS and/or non-QoS sessions~~ based on wireless network **QoS availability or congestion** ~~bandwidth access~~.

37. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

~~execute~~ implement a QoS router for **~~dynamically~~ assisting in** managing one or more QoS sessions **~~and one or more non-QoS sessions~~** for the **end user** communications device, wherein the QoS router **is configured to assist in implementing at least one of:** upgrade**[[s]] a** QoS class**[[es]] or a QoS level**, downgrade[[s]] **a** QoS class**[[es]] or a QoS level**, deallocate**[[s]] a** QoS class**[[es]] or a QoS level**, **traffic shape communication associated with the one or more QoS sessions, delay communication associated with the one or more QoS sessions, time window communication associated with the one or more QoS sessions, throttle communication associated with the one or more QoS sessions, queue with priority communication associated with the one or more QoS sessions, and block communication associated with the one or more QoS sessions ~~and/or throttles service level usage for one or more QoS and/or non-QoS sessions based on wireless network bandwidth access~~**, and wherein the QoS router **~~facilitates~~ assists in implementing** one or more of the following: **a background QoS service level;** a **~~non-QoS~~** best effort service level, a QoS differentiated service level, and a QoS guaranteed service level.

38. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

~~facilitate~~ assist in managing a plurality of QoS sessions using a QoS router, wherein **a QoS class is associated with each QoS session; and wherein the QoS router is configured to assist in passing, routing, directing, queuing or tunneling a first QoS service activity over a first QoS channel, the first QoS channel associated with a first QoS class, and wherein the QoS router is further configured to assist in passing, routing, directing, queuing or tunneling a second QoS service activity over a second QoS channel, the second QoS channel associated with a second QoS class ~~the QoS router allocates an authorized QoS class for each QoS request, and wherein the QoS router periodically modifies the QoS class allocations for one or more QoS sessions and/or throttles non-QoS sessions to facilitate the plurality of QoS sessions; and~~**

~~determine charging for each of the plurality of QoS sessions, wherein the charging for each of the plurality of QoS sessions is periodically verified~~.

39. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

receive network ~~capacity~~ **QoS** information from a **network element, a** base station **or a service controller, the network QoS information comprising one or more of network capacity information, network congestion information, QoS availability information and a QoS policy**; and

~~execute~~ **implement** a QoS router for **assisting in** managing one or more QoS sessions for the **end user** communications device **based on the received network QoS information~~, wherein the QoS router periodically modifies QoS class allocations for the one or more QoS sessions and/or throttles non-QoS sessions based on the network capacity information~~**.

40. (Canceled)

41. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

~~executing~~ **implement** a QoS router, wherein the user is offered a choice of whether or not to allow the QoS router to dynamically manage QoS and/or non-QoS services.

42. (Currently Amended) The system recited in claim 1, wherein the processor is further configured to:

assist in determin**[[e]]ing a service usage accounting** ~~charging~~ for a QoS session, wherein the ~~charging~~ **service usage accounting** is determined based **at least in part** on one or more of the following: **a Qos level,** a QoS class, **a traffic priority level, a network type,** an allocated network bandwidth, a ~~router queue~~ **QoS** priority, and ~~per allocated~~ **a** radio access bearer (RAB) **type~~, and wherein the charging for the QoS session is verified~~**.

43-46. (Canceled)

47. (Currently Amended) A method **performed by one or more processors in an end user communications device, the method** comprising:

determining a quality of service (QoS) request for a service over a wireless network; and

verifying the QoS request for the service over the wireless network.

48. (Currently Amended) A computer program product, the computer program product being embodied in a **non-transitory** computer readable storage medium and comprising computer instructions **executed in one or more processors of an end user communications device** for:

determining a quality of service (QoS) request for a service over a wireless network; and

verifying the QoS request for the service over the wireless network.

49-50. (Canceled)

51. (New) The system recited in claim 13, wherein the QoS rules are associated with a service plan for the end user communications device.

52. (New) The system recited in claim 13, wherein the QoS rules are stored in the end user communications device.

53. (New) The system recited in claim 13, wherein the processor of the end user communications device is configured to:

assist in providing a user notification through a user interface of the end user communications device, the user notification describing an aspect of the QoS rules.

54. (New) The system recited in claim 14, wherein the action comprises one or more of: assist to establish a QoS channel; assist to provide a QoS level; forward information about the QoS request to a network element or to a service controller; assist to deny the QoS channel; assist to deny the QoS level; decline to forward information about the QoS request to the network element or to the service controller; and assist in providing a user interface notification associated with the QoS request.

55. (New) The system recited in claim 15, wherein the QoS service activity comprises an attempted or successful network access associated with one or more of the following: an application, a network destination, a network source, a network end point, a URL, a website, a network server, a particular service provider, a particular network type, a traffic type, a content type, a network protocol, a traffic session type, a QoS identifier, a time of day, a state of network capacity, a network busy state, a user service plan authorization or standing, a roaming or home network status, VOIP traffic, streaming video traffic, differentiated access bandwidth during busy network periods, real-time interactive traffic, communications that include network connected multimedia meetings, communications that include shared presentations,

communications that include pictures, communications that include videos, communications that include voice, Internet browsing, SMS or push to talk, email message body delivery, email attachment delivery, communications associated with background download services, communications associated with email downloads or other file transfers, communications associated with FTP, communications taking place when the user is not interacting with an application that is communicating with the network, communications associated with software updates, communications associated with a best effort QoS level; communications associated with an interactive QoS level, communications associated with a QoS level for time sensitive services, communications associated with a guaranteed bit rate QoS level, communications associated with a near real time or interactive QoS level, and communications associated with a background QoS level.

56. (New) The system recited in claim 15 wherein the QoS service activity comprises an application running on the end user communications device.

57. (New) The system recited in claim 56, wherein the one or more QoS service levels comprise a background service level; and wherein the processor is further configured to assist in implementing a QoS policy associated with the background service level.

58. (New) The system recited in claim 15, wherein the one or more QoS service levels comprise a background service level; and wherein the processor is further configured to assist in implementing a QoS policy associated with the background service level.

59. (New) The system recited in claim 16, wherein the user notification includes one or more of the following: a denial of the QoS request, information explaining reason(s) for a denial of the QoS request, an option to purchase a new service level for the QoS request, and an option to upgrade to a new service plan.

60. (New) The system recited in claim 35, wherein the QoS policy information comprises information to assist in passing, routing, directing, queuing or tunneling one or more service activities for transmission over a QoS channel; and wherein the action that assists in managing one or more QoS sessions comprises assisting in passing, routing, directing, queuing or tunneling the one or more service activities over the QoS channel.

61. (New) The system recited in claim 35, wherein the QoS policy information comprises information to assist in delaying, deferring, time windowing, queuing, prioritizing, throttling, or traffic shaping one or more communications associated with one or more service activities over the wireless network; and the action that assists in managing one or more QoS sessions comprises assisting in passing, routing, directing, queuing or tunneling one or more communications associated with the one or more service activities over the wireless network.

62. (New) The system recited in claim 38, wherein the first QoS channel or the second QoS channel is one or more of a prioritized traffic queue and a radio access bearer.

63. (New) The system recited in claim 39, wherein assisting in managing one or more QoS sessions for the end user communications device comprises assisting to implement one or more traffic shaping parameters for the one or more QoS sessions.

64. (New) The system recited in claim 1, wherein determine the quality of service (QoS) request for the service over the wireless network comprises identify an attempted or successful traffic flow associated with a QoS level, the attempted or successful traffic flow comprising one or more related data transfers.

65. (New) The system recited in claim 64, wherein identify the attempted or successful traffic flow comprises tag the attempted or successful flow to preserve an association between the attempted or successful traffic flow and an application when the attempted or successful traffic flow is processed by one or more operations on the end user communications device.

66. (New) The system recited in claim 64, wherein identify the attempted or successful traffic flow comprises tag the attempted or successful traffic flow to preserve an association between the attempted or successful traffic flow and a traffic type when the attempted or successful traffic flow is processed by one or more operations on the end user communications device.

67. (New) The system recited in claim 64, wherein identify the attempted or successful traffic flow comprises tag the attempted or successful traffic flow to preserve an association between the attempted or successful traffic flow and a network endpoint or network destination when the attempted or successful traffic flow is processed by one or more operations on the end user communications device.

68. (New) The system recited in claim 64, wherein identify the attempted or successful traffic flow comprises tag the attempted or successful traffic flow to preserve an association between the attempted or successful traffic flow and a traffic route, a traffic re-direction, a traffic tunnel, a QoS channel, a radio access bearer, or a logical channel when the attempted or successful traffic flow is processed by one or more operations on the end user communications device.

69. (New) The system recited in claim 1, wherein the processor is further configured to provide a QoS application programming interface (API), the QoS API comprising an interface on the end user communications device for communicating QoS information to or from an application on the end user communications device.

70. (New) The system recited in claim 69, wherein the QoS information communicated to or from the application comprises information to inform the application of at least one of an available QoS level, a level of network congestion, an available data rate, an available bandwidth, and an available communication performance level.

71. (New) The system recited in claim 69, wherein the QoS information communicated to or from the application comprises information to inform the application of one or more networks to which the end user communications device is connected or is capable of being connected.

72. (New) The system recited in claim 69, wherein the QoS information communicated to or from the application comprises information enabling the application to request or establish a level of QoS, a QoS channel or a QoS enabled radio access bearer.

73. (New) The system recited in claim 1, wherein determine the quality of service (QoS) request for the service over the wireless network comprises:

identify an attempted or successful QoS service activity, and

associate the identified attempted or successful QoS service activity with a QoS level based on the identified attempted or successful QoS service activity and on a QoS activity map.

74. (New) The system recited in claim 73, wherein the QoS activity map comprises an association between the QoS level and the identified attempted or successful QoS service activity, the association being stored locally on the end user communications device.

75. (New) The system recited in claim 74, wherein the attempted or successful QoS service activity comprises an application running on the end user communications device.

76. (New) The system recited in claim 74, wherein the QoS service activity comprises an attempted or successful network access associated with one or more of the following: an application, a network destination, a network source, a network end point, a URL, a website, a network server, a particular service provider, a particular network type, a traffic type, a content type, a network protocol, a traffic session type, a QoS identifier, a time of day, a state of network capacity, a network busy state, a user service plan authorization or standing, a roaming or home network status, VOIP traffic, streaming video traffic, differentiated access bandwidth during busy network periods, real-time interactive traffic, communications that include network connected multimedia meetings, communications that include shared presentations, communications that include pictures, communications that include videos, communications that include voice, Internet browsing, SMS or push to talk, email message body delivery, email attachment delivery, communications associated with background download services, communications associated with email downloads or other file transfers, communications associated with FTP, communications taking place when the user is not interacting with an application that is communicating with the network, communications associated with software updates, communications associated with a best effort QoS level, communications associated with an interactive QoS level, communications associated with a QoS level for time sensitive services, communications associated with a guaranteed bit rate QoS level, communications associated with a near real time or interactive QoS level, and communications associated with a background QoS level.

77. (New) The system recited in claim 74, wherein the processor of the end user communications device is further configured to update at least an aspect of the QoS activity map based on information received from a network element or from a service controller.

78. (New) The system recited in claim 77, wherein the processor of the end user communications device is further configured to obtain the association between the QoS level and the identified attempted or successful service activity for the QoS activity map from a network element or from a service controller.

79. (New) The system recited in claim 1, wherein determine the quality of service (QoS) request for the service over the wireless network comprises identify a QoS rule for an attempted or successful service usage activity by the end user communications device, and wherein the processor of the end user communications device is further configured to assist in implementing the QoS rule using a QoS router function.

80. (New) The system recited in claim 79, wherein the QoS rule comprises to pass, to route or to re-direct a traffic flow associated with the attempted or successful service usage activity to one or more of a device QoS processing queue, a QoS channel, a particular radio access bearer, a particular network tunnel, a particular network logical channel, and a particular network end point.

81. (New) The system recited in claim 79, wherein identify the QoS rule for the attempted or successful service usage activity by the end user communications device comprises:

monitor the attempted or successful service usage activity; and

identify the QoS rule based on information from the monitoring.

82. (New) The system recited in claim 79, wherein the QoS rule is identified based on a QoS mapping associated with one or more of a particular application, a particular network destination or end point, a particular traffic type, a network QoS availability level, a network congestion level and a network type.

83. (New) The system recited in claim 79, wherein the processor of the end user communications device is further configured to assist in implementing the QoS rule by delaying, deferring, time windowing, queuing, prioritizing, throttling, or traffic shaping one or more communications associated with the attempted or successful service usage activity.

84. (New) The system recited in claim 79, wherein the processor of the end user communications device is further configured to obtain an update for at least an aspect of the QoS rule from a network element or a service controller.

85. (New) The system recited in claim 1, wherein determine the quality of service (QoS) request for the service over the wireless network comprises:

determine a first QoS rule associated with a first attempted or successful service usage activity by the end user communications device; and

determine a second QoS rule associated with a second attempted or successful service usage activity by the end user communications device;

wherein the processor of the end user communications device is further configured to assist in implementing the first QoS rule and the second QoS rule using a QoS router function.

86. (New) The system recited in claim 85, wherein the first QoS rule is to pass, to route or to re-direct a traffic flow associated with the first attempted or successful service usage activity to one or more of a device QoS processing queue, a QoS channel, a particular radio access bearer, a particular network tunnel, a particular network logical channel, and a particular network end point; and the second QoS rule differs from the first QoS rule.

87. (New) The system recited in claim 85, wherein the first QoS rule is determined based on monitoring the first attempted or successful service usage activity and determining the first QoS rule based on information from the monitoring, and the second QoS rule is determined based on monitoring the second attempted or successful service usage activity.

88. (New) The system recited in claim 85, wherein the first QoS rule is determined based on a first QoS mapping for a first particular application, a particular network destination or end point, a particular traffic type, a network QoS availability level, a network congestion level, or a network type and the second QoS rule is determined based on a second QoS mapping for a second particular application.

89. (New) The system recited in claim 85, wherein the first QoS rule is determined based on information obtained with the assistance of a QoS application programming interface (API), the QoS API comprising an interface on the end user communications device for communicating QoS information to or from an application on the end user communications device.

90. (New) The system recited in claim 85, wherein the first QoS rule is determined based on first information obtained from a first application with the assistance of a QoS application programming interface (API), and the second QoS rule is determined based on second information obtained from a second application with the assistance of the QoS API, the QoS API

comprising an interface on the end user communications device for communicating QoS information to or from the first and second applications.

91. (New) The system recited in claim 85, wherein processor in the end user communications device is further configured, based on the first QoS rule, to assist in delaying, deferring, time windowing, queuing, prioritizing, throttling, or traffic shaping one or more communications associated with the first attempted or successful service usage activity; and, based on the second QoS rule, to assist in delaying, deferring, time windowing, queuing, prioritizing, throttling, or traffic shaping one or more communications associated with the second attempted of successful service usage activity.

92. (New) The system recited in claim 85, wherein the processor of the end user communications device is further configured to obtain an update for at least an aspect of the first QoS rule from a network element or a service controller.

93. (New) The system recited in claim 1, wherein the QoS request for the service over the wireless network is a first QoS request for a first service over the wireless network and the processor is further configured to:

determine a second QoS request for a second service over the wireless network; and

assist in simultaneously providing a first QoS level for the first service and a second QoS level for the second service, wherein the first QoS level differs from the second QoS level.

94. (New) The system recited in claim 1, wherein the processor is further configured to obtain at least an aspect of a QoS activity map from a user interface, the QoS activity map providing an association of a QoS service activity with one or more QoS service levels; and wherein determine the quality of service (QoS) request for the service over the wireless network comprises monitor use of the service and identify the QoS service activity; and wherein verify the QoS request for the service over the wireless network comprises obtain a QoS rule from the QoS activity map and apply the QoS rule, the QoS rule configured to assist in implementing the one or more QoS service levels for communication associated with the QoS service activity.

95. (New) The system of claim 94, wherein the QoS service activity comprises an attempted or successful network access associated with one or more of the following: an application, a network destination, a network source, a network end point, a URL, a website, a network server,

a particular service provider, a particular network type, a traffic type, a content type, a network protocol, a traffic session type, a QoS identifier, a time of day, a state of network capacity, a network busy state, a user service plan authorization or standing, a roaming or home network status, VOIP traffic, streaming video traffic, differentiated access bandwidth during busy network periods, real-time interactive traffic, communications that include network connected multimedia meetings, communications that include shared presentations, communications that include pictures, communications that include videos, communications that include voice, Internet browsing, SMS or push to talk, email message body delivery, email attachment delivery, communications associated with background download services, communications associated with email downloads or other file transfers, communications associated with FTP, communications taking place when the user is not interacting with an application that is communicating with the network, communications associated with software updates, communications associated with a best effort QoS level, communications associated with an interactive QoS level, communications associated with a QoS level for time sensitive services, communications associated with a guaranteed bit rate QoS level, communications associated with a near real time or interactive QoS level, and communications associated with a background QoS level.

96. (New) The system recited in claim 94, wherein the QoS service activity comprises an application running on the end user communications device.

97. (New) The system recited in claim 94, wherein the QoS service level comprises a background service level.

98. (New) The system recited in claim 94, wherein the QoS service activity comprises an application running on the end user communications device, and the QoS service level comprises a background service level.

REMARKS

The Office Action mailed 02/16/2012 has been considered. Reconsideration in view of the following remarks is respectfully requested.

Claims 1-50 are pending.

Claims 1-2, 4, 6, 8-16, 21, 26, 30, 32-39, 41-42, 47-48 are amended herein.

Claims 3, 5, 17-20, 22-25, 27, 29, 31, 40, 43-46, 49-50 are canceled herein.

Claims 51-98 are new.

No new matter has been added.

Claim 1 and all dependent claims that use the same term have been amended to recite consistently an "end user communications device."

Claim Rejections – 35 U.S.C. § 102

Claims 1, 4, 17, 33 and 47-49 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Choi-Grogan et al. (US 2008/0132268A1). This rejection is respectfully traversed in view of the amended claims and remarks presented herein.

Claim 1 is amended to recite a processor of an **end user** communications device configured to "determine a quality of service (QoS) request" and to "verify the QoS request." This amendment is supported at least by paragraph [00146] of the detailed specification in which the device service processor (alone or in combination with a service controller) "verifies the QoS session using various monitoring and verification techniques described herein."

Choi-Grogan discloses updating QoS parameters for an existing radio access bearer (without tearing down the radio access bearer) in response to an update initiated by user equipment or a network node. Choi-Grogan seeks to minimize service interruptions by preserving an existing radio access bearer when changing the QoS parameters required for a service between a mobile station and a core network node (Abstract).

The Office Action cites Choi-Grogan disclosing the elements of Claim 1; however, Choi-Grogan uses two different processors, one in the mobile station to transmit a request to modify a PDP context based on a QoS parameter (paragraph [0008]), and a separate processor in a network element (namely the SGSN) to verify the requested QoS (paragraph [0043]). Choi-Grogan does not disclose that the **same** processor in an **end user** communications device is

configured to determine a QoS request and to verify the QoS request as recited in amended Claim 1. Choi-Grogan discloses changing a QoS parameter for an existing radio access bearer, when a subscriber initiates an application or other service request associated with a new QoS, rather than establishing a new radio access bearer to support the service (paragraph [0043]). The mobile station transmits a Modify PDP Context request that contains a new QoS to an associated SGSN, i.e. a network node, which subsequently verifies whether the subscriber is authorized for the requested QoS update (paragraph [0043]). In contrast to amended Claim 1, which requires that the **same** processor in the **end user** communication device be configured to determine and verify the QoS request, Choi-Grogan describes the mobile station determining the QoS request and the network node verifying the QoS request. Claim 1 is distinguished over Choi-Grogan at least in that a processor in the end user communications device can perform both steps; and network control signaling resources are not required to communicate messages between the end user communication device and the wireless network until the QoS request is verified. The method described in Choi-Grogan requires communication between a device and a wireless network to determine verification of authorization.

It is respectfully submitted that Choi-Grogan does not anticipate Claim 1 as amended and that Claim 1 is patentable over the prior art of record.

Claim 4 depends directly from Claim 1 and for at least the same reasons cited above for Claim 1, it is respectfully submitted that Claim 4 is patentable over the prior art of record. Claim 4 has been amended to recite "QoS levels," which is supported at least by paragraph [0027] of the detailed specification of the application as filed.

Claim 17 is canceled herein, and therefore the rejection of Claim 17 is moot.

Claim 33 has been amended to be consistent with amended Claim 1 by reciting an end user communications device. Claim 33 depends directly from Claim 1 and for at least the same reasons cited above for Claim 1, it is respectfully submitted that Claim 33 is patentable over the prior art of record.

Claim 47 has been amended to require that the method is performed by one or more processors in an end user communications device. Similarly, Claim 48 has been amended to require that the computer program product is executed in one or more processors in an end user communications device. It is respectfully submitted that Choi-Grogan does not anticipate amended Claims 47 and 48, as Choi-Grogan discloses verification occurs in a processor in a

network device and not in the end user communications device as required by amended Claims 47 and 48. For at least this reason, it is respectfully submitted Claims 47 and 48 as amended are not anticipated by Choi-Grogan and that Claims 47 and 48 are patentable over the prior art of record.

Claim 49 has been cancelled herein, and therefore the rejection of Claim 49 is moot.

Claim Rejections – 35 U.S.C. § 103

Claims 2-3, 5-16, 18-32 and 34-45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Choi-Grogan et al. (US 2008/0132268A1) and as being unpatentable over Choi-Grogan in view of Cheng et al. (U.S. 2003/01 33408 A1). These rejections are respectfully traversed in light of the amended claims and remarks presented herein.

Claim Rejections Based Solely on Choi-Grogan

Claims 2, 6-16, 21, 26, 28, 30, 32 and 34-39 and 41-42 depend directly from Claim 1, and for at least the same reasons cited above for Claim 1, it is respectfully submitted that Claims 2, 6-16, 21, 26, 28, 30, 32 and 34-39 and 41-42 are patentable over Choi-Grogan.

Claim 6 has been amended to recite that "determine the QoS request" (recited in Claim 1) comprises "obtain the QoS request through a QoS application programming interface (API)" that comprises "an interface on the end user communications device configured to communicate QoS information to or from an application on the end user communications device." The Office Action is silent regarding this particular feature, and it is respectfully submitted that a QoS API as recited in Claim 6 is not described in nor obvious in view of Choi-Grogan. While Choi-Grogan discloses QoS parameters associated with applications, Choi-Grogan does not describe a QoS API through which QoS information can be communicated with an application. It is respectfully submitted for this additional reason that Claim 6 is patentable over Choi-Grogan.

Claim 9 recites the processor is configured to "assist in providing a user interface notification" that includes one or more required elements. The Office Action does not address the additional limitations of Claim 9, and it is respectfully submitted that Choi-Grogan does not disclose, nor would it be obvious to modify Choi-Grogan to include, a user interface notification

that includes one or more of the required elements recited in Claim 9. It is respectfully submitted for this additional reason that Claim 9 is patentable over Choi-Grogan.

Claim 11 recites the processor is configured to "assist in implementing a service profile for assisting control of the end user communications device's use of the service on the wireless network." As required by Claim 11, the service profile includes one or more service policy settings. Claim 11 has also been amended to recite that the processor is configured to update the service profile using information obtained from a network element or from a service controller. This amendment is supported at least by paragraph [00124] of the detailed specification of the application as filed in which a variety of service profiles are defined and applied individually or as a superset in an end user communications device. The Office Action does not address the additional limitations recited in Claim 11, and it is respectfully submitted that Choi-Grogan does not disclose, nor would it be obvious to modify Choi-Grogan to include, a service profile as recited in Claim 11. It is respectfully submitted for this additional reason that Claim 11 is patentable over Choi-Grogan.

Claim 12 recites the processor in the end user communications device is configured to "determine if the QoS request is authorized based on a service plan." As discussed above for Claim 1, the processor is in the end user communications device, and Choi-Grogan does not describe the processor in the end user communications device determining authorization of the QoS request as recited in Claim 12. Claim 12 has also been amended to recite that when the QoS request is authorized, the processor is configured to "prevent an enablement of a QoS channel associated with the QoS request." This amendment is supported at least by paragraphs [0030] to [0033]. Choi-Grogan does not disclose, nor would it be obvious to modify Choi-Grogan to include, this additional limitation. For at least these additional reasons, it is respectfully submitted that Claim 12 is patentable over Choi-Grogan.

Claim 13 recites the processor in the end user communications device is configured to "determine if the QoS request is authorized based on QoS rules." As described above for Claim 12, Choi-Grogan does not describe authorization by the processor in the end user communications device using QoS rules. For this additional reason, it is respectfully submitted that Claim 13 is patentable over the prior art of record.

Claim 14 recites the processor in the end user communications device is configured to "determine if the QoS request is allowed based at least in part on" an "aspect of QoS rules"

obtained "from a service controller or a network element." As described above for Claims 12-13, Choi-Grogan does not describe allowing the QoS request by the processor in the end user communications device using an aspect of QoS rules as recited in Claim 14. For this additional reason, it is respectfully submitted that Claim 14 is patentable over the prior art of record.

Claim 16 recites the processor in the end user communications device is configured to "determine if the QoS request is authorized." Choi-Grogan does not disclose the processor in the end user communications device determining authorization for the QoS request as required by Claim 16. For at least this additional reason, it is respectfully submitted that Claim 16 is patentable over the prior art of record.

Claim 30 has been amended to recite the processor in the end user communications device is configured to "assist in determining accounting for the QoS session." Choi-Grogan does not disclose, nor would it be obvious to modify Choi-Grogan to include, the end user device assisting in determining accounting for the QoS session. It is respectfully submitted that for at least this additional reason, Claim 30 is patentable over the prior art of record.

Claim 32 has been amended to recite the processor is configured to "assist in a QoS routing, the QoS routing configured to pass, direct, route, forward, tunnel or queue each of a plurality of service activities to at least one of the plurality of QoS channels or sessions." Choi-Grogan does not disclose this additional limitation that routes multiple service activities to multiple QoS channels or sessions. Choi-Grogan specifically describes a single PDP context using a single radio bearer and teaches away from multiple PDP contexts and multiple radio bearers (paragraph [0056]). It would not be obvious to modify Choi-Grogan to include multiple QoS channels, multiple QoS sessions and routing between multiple service activities to one or more of QoS channels or QoS sessions, as Choi-Grogan seeks only to change QoS parameters for a single established radio access bearer. Therefore, for at least this additional reason, it is respectfully submitted that Claim 32 is patentable over the prior art of record.

Claim 34 recites that the processor is configured to "send network capacity information or network congestion information to a network element or to a service controller." Choi-Grogan does not disclose this additional limitation. The Office Action asserts that "network capacity" is common knowledge in the art; however, Claim 34 recites the processor of the end user communications device sending network capacity or network congestion information to a network element. It is respectfully submitted that at the effective filing date of the instant

application, it was not common knowledge for an end user communications device to send network capacity or network congestion information to a network element as recited in Claim 34. For at least this additional reason, it is respectfully submitted that Claim 34 is patentable over the prior art of record.

Claim 35 has been amended to recite the processor in the end user communications device is configured to receive QoS policy information and utilize the QoS policy information to assist in managing a plurality of QoS sessions. Choi-Grogan does not disclose these limitations, nor would it be obvious to modify Choi-Grogan to include multiple QoS sessions, as Choi-Grogan seeks to modify QoS for a single established radio access bearer alone. Choi-Grogan does not describe receiving QoS policy information to manage multiple QoS sessions in an end user communications device as required by Claim 35. For at least this additional reason, it is respectfully submitted that Claim 35 is patentable over the prior art of record.

Claims 36-39 and 41 recite a QoS router. The Office Action states that "QoS router" is well known in the art. This assertion is respectfully traversed. It is respectfully submitted that at the effective filing date of the instant application, it was not common knowledge for an end user communications device to include a QoS router as recited in Claims 36-39 and 41. Each of Claims 36-39 and Claim 41 recite features of the QoS router that are not disclosed in the cited prior art, nor would it be obvious to modify the cited prior art to include these required features. Claims 36 and 37 recite "the QoS router for assisting in managing one or more QoS sessions for the end user communications device" implementing at least one of a list of QoS actions "based on wireless network QoS availability or congestion." It is respectfully submitted that such a QoS router that assists in managing QoS sessions on an end user communications device is not disclosed in Choi-Grogan, nor would it be obvious to modify Choi-Grogan to include the required features of Claims 36 and 37. Claim 38 recites the QoS router managing "a plurality of QoS sessions." Choi-Grogan does not disclose, nor would it be obvious to modify Choi-Grogan to include, multiple sessions, as Choi-Grogan specifically addresses modifying a single PDP context. Claim 38 also recites the QoS router assisting in connecting two different QoS service activities to two different QoS channels, each QoS channel having its own QoS class. This feature is not disclosed by, nor would it be obvious in view of, the cited prior art. Claim 39 recites the processor implementing the QoS router based on received network QoS information. This feature is also not disclosed by, nor would it be obvious in view of, the cited prior art. For at

least all of the reasons cited above, it is respectfully submitted that Claims 36-39 and 41 are patentable over the prior art of record.

Claim 42 has been amended to recite the processor in the end user communications device is configured to "assist in determining a service usage accounting for a QoS session," the service usage accounting determined at least in part on one or more elements. Choi-Grogan does not disclose, nor would it be obvious in view of Choi-Grogan to include, the recited elements of a service usage accounting in an end user communications device as required by Claim 42. For at least this additional reason, it is respectfully submitted that amended Claim 42 is patentable over the prior art of record.

In section 6, the Office Action takes Official Notice that VoIP based internet based service, access rules, a processor monitoring use of service, determine a plurality of outgoing QoS requests and its authorization from a service controller, implement a service profile based upon access rules, network capacity, a base station and a QoS router are all common knowledge in the art, and that to have provided these services along with the teachings of Choi-Grogan would have been obvious to incorporate common knowledge technology for its intended use. Applicant respectfully disagrees. Applicant respectfully submits that at least some if not all of the recited features were not common knowledge in the art as of the effective filing date of the instant Application. For example, the Applicant respectfully submits that "a processor monitoring use of service" in an end user communications device was not common knowledge in the art. Monitoring service usage/activity in an end user communications device is described at least in paragraphs [0082]-[0083] of the instant application. Applicant also respectfully submits that use of a service profile or a service policy or QoS rules by a processor in an end user communications device as described and claimed in the instant Application was not common knowledge in the art. In addition, Applicant respectfully submits that a QoS router implemented by a processor in an end user communications device, at least as discussed above for Claims 36-39 and 41, was not common knowledge in the art. Applicant further respectfully submits that it would not have been obvious, at the effective filing date of the application, to combine these features with the teachings of Choi-Grogan because these features would provide no benefit to changing a QoS parameter for a single radio access bearer as addressed in Choi-Grogan.

Claim Rejections Based on Choi-Grogan in View of Cheng

Cheng discloses an apparatus and method for enhancing VoIP communication services at a selected QoS level in a radio communication system (Abstract).

Claims 2-3, 5-16, 18-32 and 34-45 depend directly from Claim 1, and it is respectfully submitted that Claims 2-3, 5-16, 18-32 and 34-35 are patentable over Choi-Grogan in view of Cheng because neither Choi-Grogan nor Cheng discloses the **same** processor in an **end user** communications device configured to determine a QoS request and to verify the QoS request as recited in amended Claim 1 from which each of Claims 2-3, 5-16, 18-32 and 34-45 directly depend, nor would it be obvious to modify Choi-Grogan in view of Cheng to include this required limitation. For at least this reason, it is respectfully submitted that Claims 2-3, 5-16, 18-32 and 34-35 are patentable over of the prior art of record.

While the Office Action rejects Claims 2-3, 5-16, 18-32 and 34-45 as being unpatentable over Choi-Grogan in view of Cheng, the Office Action only cites Cheng as disclosing "a processor designed to send a QoS request for network resources for an end to end service." Only Claims 46 and 50 recited "an end to end coordinated QoS service," and as both Claims 46 and 50 are cancelled herein, it is respectfully submitted that rejection of these claims are moot. The Office Action provides no arguments to reject Claims 2-3, 5-16, 18-32 and 34-45 using Choi-Grogan in view of Cheng, and thus the Applicant cannot respond.

New Claims

Claims 51-98 are new. Claims 51-98 are fully supported by the detailed specification of the Application as originally filed.

Claims 51-52 are supported at least by paragraph [00142].

Claim 53 is supported at least by paragraph [00145].

Claim 54 is supported at least by paragraphs [0023], [0036], [0039], [00141]-[00143].

Claims 55-58 are supported at least by paragraphs [0026]-[0027].

Claim 59 is supported at least by paragraph [00140].

Claims 60-61 are supported at least by paragraphs [0034]-[0036].

Claims 62-63 are supported at least by paragraphs [0034]-[0039].

Claims 64-68 are supported at least by paragraphs [0093], [00148].

Claims 69-72 are supported at least by paragraphs [0041], [0044].

Claims 73-75 are supported at least by paragraphs [0083], [00127], [00135], [00137], [00142].

Claim 76 is supported at least by paragraphs [0026]-[0027].

Claims 77-78 are supported at least by paragraphs [0040], [00140], [00141].

Claims 79-80 are supported at least by paragraphs [0041], [0048], [00126].

Claim 81 is supported at least by paragraph [0082].

Claim 82 is supported at least by paragraph [00137].

Claim 83 is supported at least by paragraphs [0034]-[0036].

Claim 84 is supported at least by paragraph [0040].

Claims 85-86 are supported at least by paragraphs [0039], [0041], [0048], [00126].

Claim 87 is supported at least by paragraph [0082].

Claim 88 is supported at least by paragraph [00137].

Claims 89-90 are supported at least by paragraphs [0041], [0044].

Claim 91 is supported at least by paragraphs [0034]-[0036].

Claim 92 is supported at least by paragraph [0040].

Claim 93 is supported at least by paragraphs [0034]-[0036].

Claim 94 is supported at least by paragraphs [00126]-[00127], [00131], [00135], [00140]-[00141].

Claims 95-98 are supported at least by paragraphs [0026]-[0027].

CONCLUSION

Applicant respectfully requests entry of the amendments provided herein. If the Examiner has any questions, needs any additional information or believes that a telephone conference would expedite prosecution of this application, the Examiner is invited to contact the undersigned at the telephone number set out below.

Respectfully submitted,

Date: August 16, 2012

By: James T. Aslanis, Jr.

James T. Aslanis, Jr.
Reg. No. 65,944
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: August 16, 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) RALEP029 [26WV-160506]
Application Number 12/695,021	Filed January 27, 2010
For Quality of Service for Device Assisted Services	
Art Unit 3687 Conf. No. 7079	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 65944

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

James T. Aslanis, Jr. — Signature

August 16, 2012 — Date

James T. Aslanis, Jr. — Typed or printed name

650-517-2786 — 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:	12695021
Filing Date:	27-Jan-2010
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	James T. Aslanis Jr./Ann Taylor
Attorney Docket Number:	RALEP029 [26WV-160506]
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	28	30	840
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 $0 paid	2253	1	635	635
Miscellaneous:				
		Total in USD ($)		**1475**

Electronic Acknowledgement Receipt	
EFS ID:	13518899
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	107265
Filer:	James T. Aslanis Jr./Ann Taylor
Filer Authorized By:	James T. Aslanis Jr.
Attorney Docket Number:	RALEP029 [26WV-160506]
Receipt Date:	16-AUG-2012
Filing Date:	27-JAN-2010
Time Stamp:	20:54:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1475
RAM confirmation Number	5981
Deposit Account	505876
Authorized User	
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File Listing:					
Document Number	**Document Description**	**File Name**	**File Size(Bytes)/ Message Digest**	**Multi Part /.zip**	**Pages (if appl.)**
1	Transmittal Letter	Trans.pdf	297480 749608e364ae3e02cccd9a46bcf1747d536e0094	no	1
Warnings:					
Information:					
2		Amendment.pdf	354190 f8817e2bc18a358f2c52c2014088077e75f1cef2	yes	28
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	18	
	Applicant Arguments/Remarks Made in an Amendment		19	28	
Warnings:					
Information:					
3	Extension of Time	Exten.pdf	300210 e985f30ccdb98f9882015adecaf716ea55c3b9aa	no	1
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	32266 f05cb1e04cd47625dcd27603fb04b9745fb95afb	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	984146		

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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
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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	29

Application Number	12/695,021
Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687 Conf. No.: 7079
Examiner Name	Rudy, Andrew J.
Attorney Docket Number	RALEP029 [26WV-160506]

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

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Headwater Partners I LLC		
Signature	James T. Aslanis, Jr.		
Printed name	James T. Aslanis, Jr.		
Date	August 16, 2012	Reg. No.	65944

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:

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Typed or printed name	Ann Taylor	Date	August 16, 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 12/695,021	Filing Date 01/27/2010	☐ 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

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	08/16/2012	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 78	Minus	** 50	= 28	X $ =		OR	X $60=	1680
	Independent (37 CFR 1.16(h))	* 3	Minus	***4	= 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	**1680**

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	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:
/CHRISTINE V.13390459 MOORE/

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

Application Number	12695021
Filing Date	2010-01-27
First Named Inventor	Raleigh, Gregory G.
Art Unit	3687
Examiner Name	Rudy, Andrew J
Attorney Docket Number	RALEP029

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	

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	Filing Date	2010-01-27
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP029

	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.	

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	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP029

	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.	

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	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP029

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	12695021
	Filing Date	2010-01-27
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
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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					
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	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.	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695021
	Filing Date	2010-01-27
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP029

	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.	
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	15	20080062900		2008-03-13	Rao, Bindu Rama	
	16	20080164304		2008-07-10	Narasimhan, Subram et al.	

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	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP029

	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.	
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	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.	
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	First Named Inventor	Raleigh, Gregory G.
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	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.	

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	Attorney Docket Number	RALEP029

	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]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		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.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695021
	Filing Date	2010-01-27
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP029

[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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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695021
	Filing Date	2010-01-27
	First Named Inventor	Raleigh, Gregory G.
	Art Unit	3687
	Examiner Name	Rudy, Andrew J
	Attorney Docket Number	RALEP029

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).

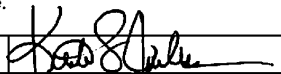
☐ See attached certification statement.

☒ 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

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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 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:	12695021
Filing Date:	27-Jan-2010
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	Krista Susan Jacobsen/Ann Taylor
Attorney Docket Number:	RALEP029 [26WV-160506]
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:	13487903
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029 [26WV-160506]
Receipt Date:	13-AUG-2012
Filing Date:	27-JAN-2010
Time Stamp:	23:40:43
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	8238
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	366446 a1a669aadb095a906ef82e89708f3d4670525ba7	no	1
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	IDS.pdf	1456892 25a5530ba7023f86a547df2ffc7d58b951ada684	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	30363 aa61b2de7f98cada3b40519ffa99f39c32ecd05f	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	9962779		

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)
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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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	12/695,021
Filing Date	2010-01-27
First Named Inventor	Gregory G. Raleigh
Art Unit	3697 Conf.: 7079
Examiner Name	Rudy, Andrew J
Attorney Docket Number	RALEP029

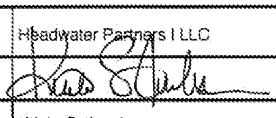
ENCLOSURES *(Check all that apply)*

- ☐ 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 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
12/695,021	01/27/2010	Gregory G. Raleigh	26WV-160506 [RALE029]

CONFIRMATION NO. 7079

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

POWER OF ATTORNEY NOTICE

OC000000055627946

Date Mailed: 08/01/2012

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).

/zabraha/

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
12/695,021	01/27/2010	Gregory G. Raleigh	26WV-160506 [RALE029]

CONFIRMATION NO. 7079

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

POA ACCEPTANCE LETTER

OC000000055627978

Date Mailed: 08/01/2012

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.

/zabraha/

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 (11-06)
Approved for use through 11/30/2011. OMB 0651-0035
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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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PTO/SB/96 (09-08)
Approved for use through 09/30/2008. OMB 0651-0031
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Gregory G. Raleigh

Application No./Patent No.: 12/695,021 Filed/Issue Date: January 27, 2010

Entitled: Quality of Service for Device Assisted Services

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 024246, Frame 0284, 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.

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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 12/695,021.

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 3:41:48 PM [Eastern Daylight Time] * SVR:W-PTOFAX-002/44 * DNIS:2738300 * CSID:16506108051 * DURATION (mm-ss):01-06

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
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/695,021	01/27/2010	Gregory G. Raleigh	26WV-160506 [RALE029]	7079

69849 7590 02/16/2012

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
02/16/2012	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)	
	12/695,021	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) 1-50 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) 1-50 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 1-50 are pending.

2. The acronym PDA from claim 2 needs to be clarified as to its meaning within the claim, e.g. see claim 1.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 4, 17, 33 and 47-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Choi-Grogan et al., US 2008/0132268 A1.

Choi-Grogan discloses, e.g. Figs. 1-8 and related text, a communications device, e.g. [0008], a network device, e.g.102, a wireless network to determine a quality of service (QoS), e.g. [0010-0011, 0031, 0043, 0045, 0053], QoS indicators, e.g. 510, a computer readable medium, e.g. 502, applications, e.g. 504, 506, 508, a request for service over the wireless network, e.g. [0043], a radio network system, e.g. 110, receiver stations nodes, e.g. 112, 113, background data, e.g. [0026], a radio network controller, e.g. 114.

Claim Rejections - 35 USC § 103

5. 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.

6. Claims 2-3, 5-16, 18-32 and 34-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi-Grogan et al., US 2008/0132268 A1.

Choi-Grogan does not disclose an VoIP based internet based service, access rules, a processor monitoring use of service, determine a plurality of outgoing QoS requests and its authorization from a service controller, implement a service profile based upon access rules, network capacity, a base station and a QoS router. Official Notice is taken that such services have been common knowledge in the art. To have provided such along with the teachings of Choi-Grogan would have been obvious to one of ordinary skill in the art in view of Official Notice. The motivation for having implemented such would have been to incorporate common knowledge technology for its intended use.

7. Claims 2-3, 5-16, 18-32 and 34-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi-Grogan et al., US 2008/0132268 A1, in view of Cheng et al., US 2003/0133408 A1..

Choi-Grogan does not disclose a processor designed to send a QoS request for network resources for an end to end QoS service. Cheng discloses such, e.g. [0002, 0011, 0019, 0022, 0026, 0028, 0031, 0071]. To have provided such along with the teachings of Choi-Grogan would have been obvious to one of ordinary skill in the art in view of Cheng. The motivation for having implemented such would have been to incorporate common knowledge technology for its intended use.

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

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

10. 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.

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/ANDREW J RUDY/

Primary Examiner, Art Unit 3687

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	AA.		
	BB.		

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Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160506 [RALEP029]

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application Number	12/695,021
Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160506 [RALEP029]

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 3 of 4

Complete if Known	
Application Number	12/695,021
Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160506 [RALEP029]

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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 4 of 4

Complete if Known	
Application Number	12/695,021
Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160506 [RALEP029]

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 23, 2010 from International Serial Number PCT/US2010/022269 filed January 27, 2010.	

Examiner Signature	/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.:	12/695,021
				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.	RALEP029

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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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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	2B	WO 2008/051379	05-02-2008	Verizon Services	
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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
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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.:	12/695,021
				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.	RALEP029

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.

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	12695021
	Filing Date	2010-01-27
	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2472
	Examiner Name	KIZOU, Hassan
	Attorney Docket Number	26WV-160506 [RALEP029]

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	2472
	Examiner Name	KIZOU, Hassan
	Attorney Docket Number	26WV-160506 [RALEP029]

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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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	Examiner Name	KIZOU, Hassan
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	14	20070298764		2007-12-27	CLAYTON	

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

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

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Search Notes	Application/Control No.	Applicant(s)/Patent under Reexamination
	12/695,021	RALEIGH, GREGORY G.
	Examiner	Art Unit
	ANDREW J. RUDY	3687

SEARCHED			
Class	Subclass	Date	Examiner
705	28,30,34	2/10/2012	AJR
709	203,217	2/10/2012	AJR
709	223,224	2/10/2012	AJR
370	395.43	2/10/2012	AJR
379	201.01	2/10/2012	AJR
455	461	2/10/2012	AJR

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
Continuity data reviewed.	2/10/2012	AJR

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Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160506 [RALEP029]

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.

American LegalNet, Inc.
www.FormsWorkFlow.com

PTO/SB/08a (07-09)
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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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	12/695,021
Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160506 [RALEP029]

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

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 3 of 4

Complete if Known	
Application Number	12/695,021
Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160506 [RALEP029]

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

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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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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	12/695,021
Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160506 [RALEP029]

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 23, 2010 from International Serial Number PCT/US2010/022269 filed January 27, 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)

	Date of mailing *(day/month/year)* 23 MAR 2010
Applicant's or agent's file reference RALEP029PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US2010/022269	International filing date *(day/month/year)* 27 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 RALEP029PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2010/022269	International filing date *(day/month/year)* 27 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/US2010/022269

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04W 72/08 (2010.01)
USPC - 370/395.43
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) - H04W 72/00, 72/02, 72/04, 72/06, 72/08; H04L 12/28, 012/54 (2010.01)
USPC - 370/395.21 395.4, 395.43; 455/452.2

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)
Orbit.com, MicroPatent,Google Patents

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 2008/0132268 A1 (CHOI-GROGAN et al) 05 June 2008 (05.06.2008) entire document	1-45, 47-49 ---- 46, 50
Y	US 2003/0133408 A1 (CHENG et al) 17 July 2003 (17.07.2003) entire document	46, 50
A	US 2005/0128967 A1 (SCOBBIE) 16 June 2005 (16.06.2005) entire document	1-50
A	US 2007/0140113 A1 (GEMELOS) 21 June 2007 (21.06.2007) entire document	1-50

☐ 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
15 March 2010	23 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)*	23 MAR 2010
Applicant's or agent's file reference RALEP029PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2010/022269	27 January 2010	28 January 2009

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - H04W 72/08 (2010.01)
USPC - 370/395.43

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 applicability
- ☐ 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	15 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/US2010/022269

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/US2010/022269

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	2-3, 5-16,18-32, 34-46, 50	YES
	Claims	1, 4, 17, 33, and 47-49	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-50	NO
Industrial applicability (IA)	Claims	1-50	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 4, 17, 33, and 47-49 lack novelty under PCT Article 33(2) as being anticipated by CHOI- GROGAN et al (US 2008/0132268 A1; hereinafter, CHOI-GROGAN).

Regarding claim 1, CHOI-GROGAN discloses a system, comprising: a processor of a communications device (paragraph 0008: mobile stations also include a processor) configured to: determine a quality of service (QoS) request for a service over a wireless network (paragraph 0010: a receiver configured to accept an indication of a requested QoS and a transmitter configured to communicate the requested QoS to a wireless communication network... a processor configured to determine if a requested QoS is different from a current QoS...); and verify the QoS request for the service over the wireless network (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS); a memory coupled to the processor and configured to provide the processor with instructions (paragraph 0008: mobile stations also include a processor configured to execute at least one application based on computer executable instructions stored in the memory).

Regarding claim 47, CHOI-GROGAN discloses a method, comprising: determining a quality of service (QoS) request for a service over a wireless network (paragraph 0010: a receiver configured to accept an indication of a requested QoS and a transmitter configured to communicate the requested QoS to a wireless communication network... a processor configured to determine if a requested QoS is different from a current QoS...); and verifying the QoS request for the service over the wireless network (The requested QoS update can be verified to determine subscriber authorization for this QoS).

Regarding claim 48, CHOI-GROGAN discloses a computer program product, the computer program product being embodied in a computer readable storage medium and comprising computer instructions (paragraph 0008: mobile stations also include a processor configured to execute at least one application based on computer executable instructions stored in the memory) for: determining a quality of service (QoS) request for a service over a wireless network (paragraph 0010: a receiver configured to accept an indication of a requested QoS and a transmitter configured to communicate the requested QoS to a wireless communication network... a processor configured to determine if a requested QoS is different from a current QoS...); and verifying the QoS request for the service over the wireless network (The requested QoS update can be verified to determine subscriber authorization for this QoS ...).

Regarding claim 49, CHOI-GROGAN discloses a system, comprising: a processor of a network device (paragraph 0030: mobile station 102 generally communicates with a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114...; paragraph 0010: the network node includes a processor...) configured to: receive a quality of service (QoS) request for a service over a wireless network from one or more communications devices (paragraph 0010: Network nodes include a receiver configured to accept an indication of a requested QoS; paragraph 0011: an input is configured to receive an updated QoS indication, wherein the processor is configured to update the QoS of the radio resource allocation based on the indication...); and determine if the QoS request for the service over the wireless network is authorized (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS; paragraph 0043: requested QoS update can be verified to determine subscriber authorization for this QoS...) and/or available based on network capacity (paragraph 0044: the radio bearer receives the QoS information and determines if the priority or bandwidth needs to be changed...); a memory coupled to the processor and configured to provide the processor with instructions (paragraph 0046: a computer readable medium 502 such as, for example, a floppy disk, hard disk, CD, DVD, random access memory, or other memory retains computer executable instructions for representative applications such as a multimedia messaging application 504, a web browser 506, and one or more games 508... each of the applications 504, 506, 508 includes one or more QoS indicators 510).

Regarding claim 4, CHOI-GROGAN discloses the system recited in claim 1, wherein the service supports one or more of the following service levels: conversational, streaming, interactive data, and background data (paragraph 0026: an appropriate QoS can be associated with a service class... "conversational"... "streaming"... "interactive"... "Background"...; also in claims 10 and 22: quality of service parameter is associated with one of conversational, streaming, interactive, and background service classes).

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Regarding claim 17, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: facilitate a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...).

Regarding claim 33, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: execute a QoS router (paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS [a router] support nodes (GGSN) 126, 128...) for dynamically managing one or more QoS sessions for the communications device (paragraph 0045: QoS can be dynamically assigned in a single RAB via a quality indicator associated with the application and stored on a user device...; paragraph 0053: dynamically adapting to changing Quality of Service (QoS) requirements... the QoS indicator can provide the requested QoS attributes per each application, such as the traffic handling priority (THP) level for interactive class...).

Claims 2-3, 5-16,18-32 and 34-45 lack an inventive step under PCT Article 33(3) as being obvious over CHOI-GROGAN.

Regarding claim 2, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the communications device is a mobile communications device (paragraph 0030: mobile station 102) or an intermediate networking device, but does not explicitly disclose that the service includes one or more Internet based services. CHOI-GROGAN, however, discloses the 3G UMTS wireless communication network that includes the Internet (paragraphs 0031-0032: the Internet 132, the Internet 170). Furthermore, Internet based services such as VoIP are well known in the art. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide support for Internet based services such as VoIP between a cellular phone and a communication device having access to the Internet.

Regarding claim 3, CHOI-GROGAN discloses the system recited in claim 1, and wherein the communications device is a mobile communications device (paragraph 0030: mobile station 102), and wherein the mobile communications device includes one or more of the following: a mobile phone (paragraph , a PDA, an eBook reader, a music device, an entertainment/gaming device, a computer, laptop, a netbook, a tablet, and a home networking system (paragraph 0028: While cell phones are common, other user equipment can be used such as, for example, laptop or palmtop computers, personal digital assistants, as well as equipment that is not mobile), but is silent on the service includes one or more Internet based services. CHOI-GROGAN, however, discloses the 3G UMTS wireless communication network that includes the Internet (paragraphs 0031-0032: the Internet 132, the Internet 170). Furthermore, Internet based services such as VoIP are well known in the art. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide support for Internet based services such as VoIP between a cellular phone and a communication device having access to the Internet.

Regarding claim 5, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the QoS request is verified based on verified QoS access rules and/or based on verified service usage monitoring. However, CHOI-GROGAN teaches verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS). Furthermore, using predetermined access rules and/or monitoring service usage to grant a QoS request is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services.

Regarding claim 6, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: receive the QoS request through a QoS application programming interface (API). However, application programming interfaces and communication of requests (such a QoS) through APIs is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide the user subscriber with a graphical interface for requesting and/or selecting services.

Regarding claim 7, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: monitor use of the service; and
determine the QoS request based on the monitored use of the service. However, CHOI-GROGAN teaches verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS). Furthermore, monitoring service usage to grant a QoS request based on the service usage rules or patterns is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services.

Regarding claim 8, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: monitor use of the service using a service processor; and determine the QoS request based on the monitored use of the service, wherein the QoS request is determined based on one or more of the following: an application activity, a service activity, and a pattern of application or service activity. However, CHOI-GROGAN teaches verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS). Furthermore, monitoring service usage to grant a QoS request based on the service usage rules or patterns of activities is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services.

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Regarding claim 9, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: monitor use of the service using a service processor; determine the QoS request based on the monitored use of the service; and execute a user interface notification if the QoS request is determined, wherein the user notification includes one or more of the following: a confirmation of the QoS request, a global confirmation for the QoS request and potential future similar types of QoS requests; an option to purchase a new service level for the QoS request, and an option to upgrade to a new service plan. However, CHOI-GROGAN teaches verifying and authorizing the user subscriber of a QoS request (paragraph 0010: the receiver is configured to send/receive an acknowledgement that the requested QoS is accepted; paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS) and sending a response upon updating the QoS parameters (paragraph 0037: the GGSN 206 transmits a Modify PDP Context response 232 to the SGSN 204, and a Modify PDP Context Accept message 234 is forwarded to the mobile station 200...). Furthermore, monitoring service usage to grant a QoS request based on the service usage rules or patterns of activities as well as notifying the user subscriber through the interface of the request being granted and/or an alternative service level being available is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services and to offer the user an alternative service level.

Regarding claim 10, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: monitor use of the service to determine an incoming QoS request or an outgoing QoS request. However, CHOI-GROGAN teaches verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS). Furthermore, monitoring service usage to grant a QoS request based on based on an incoming QoS request is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services.

Regarding claim 11, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: implement a service profile for assisting control of the communications device use of the service on the wireless network, wherein the service profile includes a plurality of service policy settings, and wherein the service profile is associated with a service plan that specifies access to the service; monitor use of the service based on the service profile; and determine the QoS request based on the monitored use of the service. However, CHOI-GROGAN teaches verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS) and storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes). Furthermore, monitoring service usage to grant a QoS request based on an incoming QoS request as well as the QoS parameters including service policy settings of the user service profile is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services.

Regarding claim 12, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: determine if the QoS request is authorized based on a service plan associated with the communications device. However, CHOI-GROGAN teaches verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS) and storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes). Furthermore, the QoS parameters including service policy settings of the user service profile is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services.

Regarding claim 13, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: determine if the QoS request is authorized based on verified QoS access rules, wherein the verified QoS access rules are associated with a service plan for the communications device. However, CHOI-GROGAN teaches verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS) and storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes). Furthermore, the QoS parameters including service policy settings of the user service profile is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services.

Regarding claim 14, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly disclose wherein the processor is further configured to: receive QoS access rules from a service controller, wherein the QoS access rules are associated with a service plan for the communications device. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS) and storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes). Furthermore, use of service controllers as well as the QoS parameters including service policy settings of the user service profile is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services.

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Regarding claim 15, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: receive QoS access rules from a service controller, wherein the QoS access rules include a QoS activity map that associates service usage and/or application usage with one or more QoS classes. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS) and storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes). Furthermore, use of service controllers as well as the QoS parameters including service policy settings of the user service profile is well known in the art, and grouping (mapping) different activities within a service or application usage is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services.

Regarding claim 16, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: determine if the QoS request is authorized based on verified QoS access rules; and execute a user interface notification if the QoS request is not authorized, wherein the user notification includes one or more of the following: a denial of the QoS request, information explaining reason(s) for a denial of the QoS request, an option to purchase a new service level for the QoS request, and an option to upgrade to a new service plan. However, CHOI-GROGAN teaches verifying and authorizing the user subscriber of a QoS request (paragraph 0010: the receiver is configured to send/receive an acknowledgement that the requested QoS is accepted; paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0051: QoS can be a function of a variety of service attributes) and sending a response upon updating the QoS parameters (paragraph 0037: the GGSN 206 transmits a Modify PDP Context response 232 to the SGSN 204, and a Modily PDP Context Accept message 234 is forwarded to the mobile station 200...). Furthermore, notifying the user subscriber of the rejection of a service request (the service not being granted) and/or an altemative service level being available is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize a user subscriber to access/use predetermined services and to offer the user an alternative service level.

Regarding claim 18, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: facilitate a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS. By adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...); but is silent on periodically verify the QoS session, wherein the QoS session is verified at least in part by comparing one or more device assisted service usage measures with one or more network based service usage measures. However, periodically verifying the usage of a service and an associated device/process to maintain the connectivity and continual usage of the service is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize assure the connectivity and to prevent idleness of resources.

Regarding claim 19, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: facilitate a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS. By adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), but is silent on periodically verify the QoS session, wherein the QoS session is verified at least in part by performing one or more of the following: compare a network based service usage measure with a first service policy associated with the communications device, compare a device assisted service usage measure with the first service policy, compare the network based service usage measure to the device assisted service usage measure, and perform a test and confirm a device assisted service usage measure based on the test. However, CHOI-GROGAN teaches QoS parameters of a first service and a second service (paragraph 0043: the new QoS is compared with a current QoS associated with a current radio access bearer (RAB) in a step 404. If the new QoS is different from the current QoS, the mobile station transmits a Modify PDP Context request to, for example, an associated SGSN in a step 406 ... Upon authorization, the PDP context is updated with the new QoS in a step 410 and communication based on the updated QoS can begin or resume). Furthermore, periodically verifying the usage of a service and an associated device/process to maintain the connectivity and continual usage of the service is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to authorize assure the connectivity and to prevent idleness of resources.

Regarding claim 20, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: facilitate a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS. By adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), but is silent on periodically verify the QoS session to verify one or more of the following: the communications device is still authorized to perform the QoS session, the QoS session is communication at an authorized QoS level, and charging is accurate for the QoS session. However, periodically verifying the permission for continued using of a service and an associated device/process based on the current security factors such as current level of authorized service is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to prevent usage of the service exceeding the allowed time.

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Regarding claim 21, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly disclose wherein the processor is further configured to: send the QoS request to an access point if the QoS request is determined to be authorized based on verified QoS access rules, wherein the access point facilitates a QoS session lor the QoS request based on network capacity. However, CHOI-GROGAN teaches facilitating a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), base stations coupled to a base station controller and providing network access (access point), selecting QoS parameters based on notifications (paragraph 0030: a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114... typically includes a plurality of base transceiver stations to provide network access in a coverage area..., selected QoS parameters can be retrieved from the HLR 122 (or the VLR 118) based on the notification...), determining if bandwidth (network capacity) should be changed for an indicated QoS request (paragraph 0044: upon receipt of this QoS indicator, a radio resource manager ... determines if the priority or bandwidth needs to be changed ...). Furthermore, sending QoS requests to access points is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

Regarding claim 22, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly disclose wherein the processor is further configured to: send the QoS request to an access point if the QoS request is determined to be authorized based on verified QoS access rules, wherein the access point facilitates a QoS session for the QoS request based on network capacity, wherein the access point includes a base station. However, CHOI-GROGAN teaches facilitating a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), base stations coupled to a base station controller and providing network access (access point), selecting QoS parameters based on notifications (paragraph 0030: a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114... typically includes a plurality of base transceiver stations to provide network access in a coverage area..., selected QoS parameters can be retrieved from the HLR 122 (or the VLR 118) based on the notification...), determining if bandwidth (network capacity) should be changed for an indicated QoS request (paragraph 0044: upon receipt of this QoS indicator, a radio resource manager ... determines if the priority or bandwidth needs to be changed ...). Furthermore, sending QoS requests to access points is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention ol CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

Regarding claim 23, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly disclose wherein the processor is further configured to: send the QoS request to a service controller, wherein the service controller coordinates a plurality of QoS requests for a plurality of communications devices in wireless communication with an access point, and wherein the service controller communicates with the access point to facilitate the QoS request for the communications device if the QoS request is determined to be authorized. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS), storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes), facilitating a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), base stations coupled to a base station controller and providing network access (access point), selecting QoS parameters based on notifications (paragraph 0030: a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114... typically includes a plurality of base transceiver stations to provide network access in a coverage area..., selected QoS parameters can be retrieved from the HLR 122 (or the VLR 118) based on the notification...). Furthermore, sending a request for service to a service controller that is in communication with access points is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the Invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

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Regarding claim 24, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly disclose wherein the processor is further configured to: send the QoS request to a service controller, wherein the service controller coordinates a plurality of QoS requests for a plurality of communications devices in wireless communication with one or more base stations, and wherein the service controller communicates with the one or more base stations to determine an available base station based on network capacity to facilitate the QoS request for the communications device if the QoS request is determined to be authorized; and receive a response to the QoS request, wherein the response includes an indication of which base station is available to facilitate the QoS request. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS), storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes), facilitating a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS Indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), base stations coupled to a base station controller and providing network access (access point), selecting QoS parameters based on notifications (paragraph 0030: a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114... typically includes a plurality of base transceiver stations to provide network access in a coverage area..., selected QoS parameters can be retrieved from the HLR 122 (or the VLR 118) based on the notification...). Furthermore, sending a request for service to a service controller that is in communication with access points as well as determining the availability of base station based of network capacity (bandwidth, e.g.) and a base station indicating its availability in response to a request is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

Regarding claim 25, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly disclose wherein the processor is further configured to: send the QoS request to a service controller, wherein the service controller coordinates a plurality of QoS requests for a plurality of communications devices in wireless communication with one or more base stations or other access point, wherein the service controller communicates with the one or more base stations to determine an available base station based on network capacity to facilitate the QoS request for the communications device if the QoS request is determined to be authorized, wherein the other access point includes a WiFi access point; and receive a response to the QoS request, wherein the response includes an indication of which base station or other access point is available to facilitate the QoS request. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS), storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes), facilitating a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS Indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), base stations coupled to a base station controller and providing network access (access point), selecting QoS parameters based on notifications (paragraph 0030: a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114... typically includes a plurality of base transceiver stations to provide network access in a coverage area..., selected QoS parameters can be retrieved from the HLR 122 (or the VLR 118) based on the notification...). Furthermore, sending a request for service to a service controller that is in communication with access points, WiFi access points, as well as determining the availability of base station based of network capacity (bandwidth, e.g.) and a base station indicating its availability in response to a request is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

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Regarding claim 26, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly wherein the processor is further configured to: send the QoS request to a service controller; receive a QoS approval authorization from the service controller if the QoS request is determined to be authorized and network capacity is determined to be available for the QoS request; send the QoS request to a base station, wherein the approved QoS request includes the QoS approval authorization for one or more QoS links for a QoS channel. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS), storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes), facilitating a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), base stations coupled to a base station controller and providing network access (access point), selecting QoS parameters based on notifications (paragraph 0030: a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114... typically includes a plurality of base transceiver stations to provide network access in a coverage area..., selected QoS parameters can be retrieved from the HLR 122 (or the VLR 118) based on the notification...). Furthermore, sending a request for service to a service controller that is in communication with access points as well as determining the availabilily of base station, network capacity (bandwidth, e.g.) and allocating a channel for an approved QoS link is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

Regarding claim 27, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly wherein the processor is further configured to: send the QoS request to a service controller; receive a QoS approval authorization from the service controller if the QoS request is determined to be authorized and network capacity is determined to be available for the QoS request, wherein the service controller communicates the QoS approval authorization to a base station; send the QoS request to the base station to initiate a QoS channel, wherein the QoS channel includes one or more QoS links. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS), storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes), facilitating a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), base stations coupled to a base station controller and providing network access (access point), selecting QoS parameters based on notifications (paragraph 0030: a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114... typically includes a plurality of base transceiver stations to provide network access in a coverage area..., selected QoS parameters can be retrieved from the HLR 122 (or the VLR 118) based on the notification...). Furthermore, sending a request for service to a service controller that is in communication with access points as well as determining the availabilily of base station, network capacity (bandwidth, e.g.) and allocating a channel for an approved QoS link is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

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Regarding claim 28, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly wherein the processor is further configured to: send the QoS request to a service controller, wherein the service controller communicates with the one or more network devices to provision a QoS channel, wherein the QoS channel includes one or more QoS links; and the service controller returns a QoS reservation for the provisioned QoS channel. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS), storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes), facilitating a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), base stations coupled to a base station controller and providing network access (access point), selecting QoS parameters based on notifications (paragraph 0030: a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114... typically includes a plurality of base transceiver stations to provide network access in a coverage area..., selected QoS parameters can be retrieved from the HLR 122 (or the VLR 118) based on the notification...). Furthermore, sending a request for service to a service controller that is in communication with various network devices for provisioning services on channels and allocating a channel for an approved QoS link is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

Regarding claim 29, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly wherein the processor is further configured to: send the QoS request to a service controller, wherein the service controller communicates with the one or more network devices to provision a QoS channel through a carrier core network and/or an IPX network, wherein the QoS channel includes one or more QoS links. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS that is in communication with various network devices (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), for provisioning services on allocated channels bases on approved QoS requests (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS), storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes). Furthermore, sending a request for service to a service controller that is in communication with various network devices including a carrier core network and/or IPX network is known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

Regarding claim 30, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: facilitate a QoS session if the QoS request is determined to be authorized (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...); but is silent on determine charging for the QoS session. However, CHOI-GROGAN teaches QoS parameters including billing information (paragraph 0027: a PDP context generally includes QoS parameters as well as information related to user billing and delivery addresses... PDP context parameters can be stored in user equipment in, for example, a subscriber identity module (SIM), or in network nodes or servers such as at a serving GPRS support node (SGSN), or a gateway GPRS support node (GGSN)...). Furthermore, determining charging for services received during a QoS session is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide the user subscriber with billing statements.

Regarding claim 31, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: facilitate a plurality of QoS sessions (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...); but is silent on determine charging for each of the plurality of QoS sessions, wherein the charging for each of the plurality of QoS sessions is periodically verified. However, CHOI-GROGAN teaches QoS parameters including billing information (paragraph 0027: a PDP context generally includes QoS parameters as well as information related to user billing and delivery addresses... PDP context parameters can be stored in user equipment in, for example, a subscriber identity module (SIM), or in network nodes or servers such as at a serving GPRS support node (SGSN), or a gateway GPRS support node (GGSN)...). Furthermore, determining charging for services received during a QoS session and verifying the charging periodically is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide the user subscriber with billing statements and to prevent the service usage exceeding a prepaid credit.

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Regarding claim 32, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: facilitate a plurality of QoS sessions (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...); but is silent on determine charging for each of the plurality of QoS sessions, wherein the charging for each of the plurality of QoS sessions is periodically verified at least in part using network based charging information. However, CHOI-GROGAN teaches QoS parameters including billing information (paragraph 0027: a PDP context generally includes QoS parameters as well as information related to user billing and delivery addresses... PDP context parameters can be stored in user equipment in, for example, a subscriber identity module (SIM), or in network nodes or servers such as at a serving GPRS support node (SGSN), or a gateway GPRS support node (GGSN)...). Furthermore, determining charging for services received during a QoS session and verifying the charging periodically based on billing information regarding the network usage charges is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide the user subscriber with billing statements and to prevent the service usage exceeding a prepaid credit.

Regarding claim 34, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: execute a QoS router (paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS [a router] support nodes (GGSN) 126, 128...) for dynamically managing one or more QoS channels for the communications device (paragraph 0045: QoS can be dynamically assigned in a single RAB via a quality indicator associated with the application and stored on a user device...; paragraph 0053: dynamically adapting to changing Quality of Service (QoS) requirements... the QoS indicator can provide the requested QoS attributes per each application, such as the traffic handling priority (THP) level for interactive class...); but is silent on send network capacity information to a service controller, wherein the service controller provides a policy decision point for QoS management for a plurality of communications devices in communication with one or more base stations. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS), storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes), facilitating a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), base stations coupled to a base station controller and providing network access (access point), selecting QoS parameters based on notifications (paragraph 0030: a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114... typically includes a plurality of base transceiver stations to provide network access in a coverage area..., selected QoS parameters can be retrieved from the HLR 122 (or the VLR 118) based on the notification...). Furthermore, sending a request for service to a service controller that is in communication with access points is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

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Regarding claim 35, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: execute a QoS router (paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS [a router] support nodes (GGSN) 126, 128...) for dynamically managing one or more QoS channels for the communications device (paragraph 0045: QoS can be dynamically assigned in a single RAB via a quality indicator associated with the application and stored on a user device...; paragraph 0053: dynamically adapting to changing Quality of Service (QoS) requirements... the QoS indicator can provide the requested QoS attributes per each application, such as the traffic handling priority (THP) level for interactive class...); but is silent on send network capacity information to a service controller, wherein the service controller provides a policy decision point for QoS management for a plurality of communications devices in communication with one or more base stations; and receive QoS router throttling instructions from the service controller, wherein the service controller provides the QoS router throttling instructions to assist in dynamically manage network capacity for the plurality of communications devices in communication with the one or more base stations. CHOI-GROGAN, however teaches a controller for allocating radio resources based on requested QoS (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the radio resource allocation is associated with a packet data protocol (PDP) context), verifying and authorizing the user subscriber of a QoS request (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS), storing of QoS parameters (0029: the mobile station 102 typically includes a subscriber identification module (SIM) 108 that includes a memory that stores various parameters associated with the subscriber and services available to the subscriber; paragraph 0051: QoS can be a function of a variety of service attributes), facilitating a QoS session if the QoS request is determined to be authorized based on verified QoS access rules (paragraph 0043: the requested QoS update can be verified to determine subscriber authorization for this QoS; paragraph 0050: radio resource manager receives a requested QoS indicator from, for example, a mobile station, and determines a QoS based on the QoS indicator...the RRM then modifies an existing radio access bearer to provide the selected QoS... by adapting the QoS associated with an active RAB, radio resources can be efficiently assigned ...), base stations coupled to a base station controller and providing network access (access point), selecting QoS parameters based on notifications (paragraph 0030: a base station subsystem (BSS) or radio network system (RNS) 110 that includes base transceiver stations (BTS or Node B) 112, 113 coupled to a base station controller (BSC) or radio network controller (RNC) 114... typically includes a plurality of base transceiver stations to provide network access in a coverage area..., selected QoS parameters can be retrieved from the HLR 122 (or the VLR 118) based on the notification...). Furthermore, sending a request for service to a service controller that is in communication with access points and base stations as wells receiving instructions to terminate a service (throttling instructions) is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

Regarding claim 36, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: execute a QoS router (paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS [a router] support nodes (GGSN) 126, 128...) for dynamically managing one or more QoS sessions (paragraph 0045: QoS can be dynamically assigned in a single RAB via a quality indicator associated with the application and stored on a user device...; paragraph 0053: dynamically adapting to changing Quality of Service (QoS) requirements... the QoS indicator can provide the requested QoS attributes per each application, such as the traffic handling priority (THP) level for interactive class...); but is silent on one or more non-QoS sessions for the communications device, and wherein the QoS router upgrades QoS classes, downgrades QoS classes, deallocates QoS classes, and/or throttles service level usage for one or more QoS and/or non-QoS sessions based on wireless network bandwidth access. However, dynamically managing non-QoS sessions, upgrading/downgrading QoS classes, and terminating (throttling) services based on availability of network bandwidth is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

Regarding claim 37, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: execute a QoS router (paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS [a router] support nodes (GGSN) 126, 128...) for dynamically managing one or more QoS sessions (paragraph 0045: QoS can be dynamically assigned in a single RAB via a quality indicator associated with the application and stored on a user device...; paragraph 0053: dynamically adapting to changing Quality of Service (QoS) requirements... the QoS indicator can provide the requested QoS attributes per each application, such as the traffic handling priority (THP) level for interactive class...); but is silent on one or more non-QoS sessions for the communications device, wherein the QoS router upgrades QoS classes, downgrades QoS classes, deallocates QoS classes, and/or throttles service level usage for one or more QoS and/or non-QoS sessions based on wireless network bandwidth access, and wherein the QoS router facilitates one or more of the following: a non-QoS best effort service level, a QoS differentiated service level, and a QoS guaranteed service level. However, dynamically managing non-QoS sessions, upgrading/downgrading QoS classes, and terminating (throttling) services based on availability of network bandwidth, providing a QoS guaranteed service level is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to maintain the authorized continual connectivity and to provide a balanced network resource allocation.

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Regarding claim 38, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: facilitate a plurality of QoS sessions using a QoS router, wherein the QoS router allocates an authorized QoS class for each QoS request, and wherein the QoS router periodically modifies the QoS class allocations for one or more QoS sessions and/or throttles non-QoS sessions to facilitate the plurality of QoS sessions; and determine charging for each of the plurality of QoS sessions, wherein the charging for each of the plurality of QoS sessions is periodically verified. However, CHOI-GROGAN teaches a router (gateway) facilitating QoS sessions (paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS [a router] support nodes (GGSN) 126, 128...; paragraph 0045: QoS can be dynamically assigned in a single RAB via a quality indicator associated with the application and stored on a user device...; paragraph 0053: dynamically adapting to changing Quality of Service (QoS) requirements... the QoS indicator can provide the requested QoS attributes per each application, such as the traffic handling priority (THP) level for interactive class...), allocating an authorized QoS class for QoS requests (paragraph 0026; paragraph 0054: when a user requests an application, the radio resource management (RRM) algorithm residing in a radio access network can consider the attributes based on four QoS traffic classes prioritize users, and allocates radio resources accordingly...) and QoS parameters including billing information (paragraph 0027: a PDP context generally includes QoS parameters as well as information related to user billing and delivery addresses... PDP context parameters can be stored in user equipment in, for example, a subscriber identity module (SIM), or in network nodes or servers such as at a serving GPRS support node (SGSN), or a gateway GPRS support node (GGSN)...). Furthermore, determining charging for services received during a QoS session and verifying the charging periodically is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide the user subscriber with billing statements and to prevent the service usage exceeding a prepaid credit.

Regarding claim 39, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly disclose wherein the processor is further configured to: receive network capacity information from a base station; and execute a QoS router for managing one or more QoS sessions for the communications device, wherein the QoS router periodically modifies QoS class allocations for the one or more QoS sessions and/or throttles non-QoS sessions based on the network capacity information. However, CHOI-GROGAN teaches executing a QoS router for managing QoS sessions (paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS [a router] support nodes (GGSN) 126, 128...; paragraph 0045: QoS can be dynamically assigned in a single RAB via a quality indicator associated with the application and stored on a user device...; paragraph 0053: dynamically adapting to changing Quality of Service (QoS) requirements... the QoS indicator can provide the requested QoS attributes per each application, such as the traffic handling priority (THP) level for interactive class...). Furthermore, receiving information regarding network capacity, periodically modifying QoS class level allocation and terminating services by receiving (throttling) instructions is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide the user subscriber with the requested predetermined QoS service.

Regarding claim 40, CHOI-GROGAN discloses the system recited in claim 1, but does not explicitly disclose wherein the processor is further configured to: receive network capacity information from a base station; and execute a QoS router for managing one or more QoS sessions for the communications device, wherein the QoS router periodically modifies QoS class allocations for the one or more QoS sessions and/or throttles non-QoS sessions based on the network capacity information; and wherein the QoS router does not downgrade QoS class allocations if the communications device is associated with a service plan that provides for a non-throttled QoS service level. However, CHOI-GROGAN teaches executing a QoS router for managing QoS sessions (paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS [a router] support nodes (GGSN) 126, 128...; paragraph 0045: QoS can be dynamically assigned in a single RAB via a quality indicator associated with the application and stored on a user device...; paragraph 0053: dynamically adapting to changing Quality of Service (QoS) requirements... the QoS indicator can provide the requested QoS attributes per each application, such as the traffic handling priority (THP) level for interactive class...). Furthermore, receiving information regarding network capacity, periodically modifying QoS class level allocation and terminating services by receiving (throttling) instructions, as well as not downgrading a QoS class allocation under a desired condition is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide the user subscriber with the requested level of services based on a predetermined service plan.

Regarding claim 41, CHOI-GROGAN discloses the system recited in claim 1, and teaches wherein the processor is further configured to: executing a QoS router (paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS [a router] support nodes (GGSN) 126, 128...) , allow the QoS router to dynamically manage QoS and/or non-QoS services (paragraph 0045: QoS can be dynamically assigned in a single RAB via a quality indicator associated with the application and stored on a user device...; paragraph 0053: dynamically adapting to changing Quality of Service (QoS) requirements... the QoS indicator can provide the requested QoS attributes per each application, such as the traffic handling priority (THP) level for interactive class...), but is silent on wherein the user is offered a choice of whether or not to dynamically managing the services. However, providing a user with a choice such as dynamically managing services is a known practice in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide the user subscriber with the requested level of services based on a predetermined service plan.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2010/022269

Supplemental Box

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

Regarding claim 42, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: determine charging for a QoS session, wherein the charging is determined based on one or more of the following: a QoS class, an allocated network bandwidth, a router queue priority, and per allocated radio access bearer (RAB), and wherein the charging for the QoS session is verified. However, CHOI-GROGAN teaches QoS parameters including billing information (paragraph 0027: a PDP context generally includes QoS parameters as well as information related to user billing and delivery addresses... PDP context parameters can be stored in user equipment in, for example, a subscriber identity module (SIM), or in network nodes or servers such as at a serving GPRS support node (SGSN), or a gateway GPRS support node (GGSN)...) and radio access bearer (paragraph 0036: SGSN 204 validates the context activation request 202 based on subscriber data ... and retrieves a network address for a GGSN 206 that is associated with the requested service... the SGSN 204 issues a request for radio resources 214 (i.e., to establish a radio access bearer or RAB) to a radio resource controller (RRC) 207 and RAB setup messages 216, 218 are exchanged between the mobile station 200 and the RRC 207... notifies the SGSN 204 that RAB is established in a message 220, and the mobile station 200 is notified that the PDP context has been activated in message 222). Furthermore, determining and verifying service charges based on various parameters including QoS class level or allocated network bandwidth or RAB is well known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide the user subscriber with billing statements and to prevent the service usage exceeding a prepaid credit.

Regarding claim 43, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: execute a service processor for implementing verified DAS QoS in a secure hardware partition of the processor. However, implementing application programs (DAS QoS services) in a secure partition of a processor (a secured address space) is known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide for secure implementation of QoS services.

Regarding claim 44, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: execute a service processor for implementing verified DAS QoS, wherein the service processor is executed in a kernel of an operating system. However, implementing a processor (executing instructions) such as application programs (DAS QoS services) in a kernel of an operating system is known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide for secure implementation of QoS services.

Regarding claim 45, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: execute a service processor for implementing verified DAS QoS, wherein the processor is in a secure modem. However, a processor implementing an application program (DAS QoS services) and secure communication network devices such as a secure modem is known in the art, the specifics of which would have been a matter of design choice. Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to incorporate the above features into the invention of CHOI-GROGAN in order to provide for secure implementation of QoS services.

Claims 46 and 50 lack an inventive step under PCT Article 33(3) as being obvious over CHOI-GROGAN in view of CHENG et al (US 2003/0133408 A1; hereinafter CHENG).

Regarding claim 46, CHOI-GROGAN discloses the system recited in claim 1, but is silent on wherein the processor is further configured to: send a QoS request for network resources for an end to end coordinated QoS service channel control for a conversational class session between the communications device and another communications device, wherein the request for network resources is directed to one or more of the following networks: a base station, a transport core network, an IPX network, and a GRX network. CHOI-GROGAN, however, teaches a GPRS system that sets up a conversational class QoS service between communications devices (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the updated QoS is associated with a service class change, wherein an updated service class is selected from a group consisting of conversational, streaming, interactive, and background service classes; paragraph 0026: service classes indicated as "conversational" are preferably associated with near real time communication with low latency and low jitter...; paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS support nodes (GGSN) 126; paragraph 0057: methods and apparatus are described based on GPRS communication within a GSM wireless communication network). Also, it is known in the art that a QoS is an end-to-end characteristic of, e.g., a data call, and that request for network resources can be directed to any network device including a base station. Furthermore, CHENG discloses apparatus, and an associated method, for enhancing VoIP communication services at a selected QoS level in a 3G cellular radio communication system (Abstract) in which in which the data is to be communicated at a selected QoS (Quality of Service) level (paragraph 0002) and teaches that a VoIP service being of a conversational class that requires low delay (paragraph 0019), a VoIP service being set up as an end-to-end communications (paragraph 0028), and sending the Service Reference ID on a control channel in a VoIP service (paragraph 0071). Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to use the teachings of CHENG to incorporate the above features into the invention of CHOI-GROGAN in order to provide improved mechanisms by which to support QoS requirements at the radio interface portion of a communication network in and end-to-end QoS architecture (CHENG: paragraph 0022).

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International application No.
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Regarding claim 50, CHOI-GROGAN discloses the system recited in claim 49, but is silent on wherein the processor is further configured to: setup an end to end coordinated QoS service channel control for a conversational class session between a first communications device and a second communications device. CHOI-GROGAN, however, teaches a GPRS system that sets up a conversational class QoS service between communications devices (paragraph 0011: radio resource controllers include a processor configured to establish a radio resource allocation based on a requested QoS... the updated QoS is associated with a service class change, wherein an updated service class is selected from a group consisting of conversational, streaming, interactive, and background service classes; paragraph 0026: service classes indicated as "conversational" are preferably associated with near real time communication with low latency and low jitter...; paragraph 0031: the BSS 110 is coupled to a serving GPRS support node (SGSN) 124 that is in communication with gateway GPRS support nodes (GGSN) 126; paragraph 0057: methods and apparatus are described based on GPRS communication within a GSM wireless communication network). Also, it is known in the art that a QoS is an end-to-end characteristic of, e.g., a data call. Furthermore, CHENG discloses apparatus, and an associated method, for enhancing VoIP communication services at a selected QoS level in a 3G cellular radio communication system (Abstract) in which in which the data is to be communicated at a selected QoS (Quality of Service) level (paragraph 0002) and teaches that a VoIP service being of a conversational class that requires low delay (paragraph 0019), a VoIP service being set up as an end-to-end communications (paragraph 0028), and sending the Service Reference ID on a control channel in a VoIP service (paragraph 0071). Therefore, it would have been obvious to a person of ordinary skill at the time of the invention to use the teachings of CHENG to incorporate the above features into the invention of CHOI-GROGAN in order to provide improved mechanisms by which to support QoS requirements at the radio interface portion of a communication network in and end-to-end QoS architecture (CHENG: paragraph 0022).

Claims 1-50 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.

Electronic Acknowledgement Receipt	
EFS ID:	12012234
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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-160506 [RALE029]
Receipt Date:	06-FEB-2012
Filing Date:	27-JAN-2010
Time Stamp:	20:57:15
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		160506-RALEP029-IDS-020612.pdf	1061859 55f711b5fc8d5a0af5a88b9467a560ac1b3c91d0	yes	25

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
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	Miscellaneous Incoming Letter	2	3
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	Non Patent Literature	8	25
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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)

Total Number of Pages in This Submission	25

Application Number	12/695,021
Filing Date	January 27, 2010
First Named Inventor	Gregory G. Raleigh
Art Unit	3687 Conf. No. 7079
Examiner Name	Andrew J. Rudy
Attorney Docket Number	26WV-160506 [RALEP029]

ENCLOSURES *(Check all that apply)*

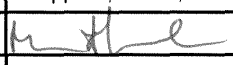
- ☐ Fee Transmittal Form
- ☐ Fee Attached
- ☐ Amendment/Reply
- ☐ After Final
- ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☒ Information Disclosure Statement with PTO/SB/08a/b (6 pgs.)
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ 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
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- ☐ 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/US2010/022269 (18 pgs.)

Remarks

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

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

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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.: 12/695,021	Art Unit: 3687
Filed: January 27, 2010	Conf. No.: 7079
Title: Quality of Service for Device Assisted Services	

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

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

PTO/SB/08a (01-10)
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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	12695021
	Filing Date	2010-01-27
	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2472
	Examiner Name	KIZOU, Hassan
	Attorney Docket Number	26WV-160506 [RALEP029]

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)		
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	Filing Date	2010-01-27
	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2472
	Examiner Name	KIZOU, Hassan
	Attorney Docket Number	26WV-160506 [RALEP029]

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

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	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2472
	Examiner Name	KIZOU, Hassan
	Attorney Docket Number	26WV-160506 [RALEP029]

	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	

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695021
	Filing Date	2010-01-27
	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2472
	Examiner Name	KIZOU, Hassan
	Attorney Docket Number	26WV-160506 [RALEP029]

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.	☐
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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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12695021
	Filing Date	2010-01-27
	First Named Inventor	RALEIGH, Gregory G.
	Art Unit	2472
	Examiner Name	KIZOU, Hassan
	Attorney Docket Number	26WV-160506 [RALEP029]

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.

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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.

Electronic Acknowledgement Receipt	
EFS ID:	10564556
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029
Receipt Date:	20-JUL-2011
Filing Date:	27-JAN-2010
Time Stamp:	19:22:05
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		160506-RALEP029-IDS072011.pdf	462912 ecdcab2a8f92293125440c74cb7cda737f8608fa	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):	462912	

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:	10564817
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029
Receipt Date:	20-JUL-2011
Filing Date:	27-JAN-2010
Time Stamp:	20:14:22
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
12/695,021	01/27/2010	Gregory G. Raleigh	RALEP029

CONFIRMATION NO. 7079

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

POA ACCEPTANCE LETTER

OC000000047408655

Date Mailed: 05/03/2011

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

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
12/695,021	01/27/2010	Gregory G. Raleigh	RALEP029

CONFIRMATION NO. 7079

21912
VAN PELT, YI & JAMES LLP
10050 N. FOOTHILL BLVD #200
CUPERTINO, CA 95014

POWER OF ATTORNEY NOTICE

OC000000047408617

Date Mailed: 05/03/2011

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

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:	9924391
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029
Receipt Date:	20-APR-2011
Filing Date:	27-JAN-2010
Time Stamp:	20:52:07
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		160506POAand3-73bStmt042011.pdf	156783 d2dc17ac3de4f0ac34917dc2b8e246753fea2a81	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):	156783	

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.: 12/695,021 Filed/Issue Date: January 27, 2010

Titled: Quality of Service for Device Assisted Services

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 0284, 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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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.
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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.:	12/695,021
Information Disclosure Statement By Applicant				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
(Use as many sheets as necessary)				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	1	Atty Docket No.	RALEP029

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.	
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	J.	US 2006/0045245	03-02-2006	AARON et al.	
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	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:	8592195
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029
Receipt Date:	08-OCT-2010
Filing Date:	27-JAN-2010
Time Stamp:	19:30:34
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	RALEP029_IDS_Before_1st_OA.pdf	56035 c37b6c7763def04144e24073ef4f102a5880cb28	no	2
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2	Information Disclosure Statement (IDS) Filed (SB/08)	RALEP029_IDS_SB08_before_1st_OA_2_.pdf	101001 bb317e749afec78e0127a01097d95b4e7a6b0d6a	no	1
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		Total Files Size (in bytes):	1479659		

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.:	12/695,021	Art Unit:	2617
Filed:	January 27, 2010	Docket No.:	RALEP029
Title:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES		

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. RALEP029).

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.:	12/695,021
				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.	RALEP029

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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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Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,021
				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.	RALEP029

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Substitute for form 1449/PTO				Complete if Known	
				Application No.:	12/695,021
Information Disclosure Statement By Applicant				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
(Use as many sheets as necessary)				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	3	of	4	Atty Docket No.	RALEP029

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	RRRRR.	US 2008/0130656	06-05-2008	KIM et al.	
	SSSSS.	US 2005/0021995	01-27-2005	LAL et al.	
	TTTTT.	US 2008/0162704	04-03-2008	POPLETT et al.	

Substitute for form 1449/PTO				Complete if Known	
				Application No.:	12/695,021
Information Disclosure Statement By Applicant				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
(Use as many sheets as necessary)				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	4	of	4	Atty Docket No.	RALEP029

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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	
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	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.

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

Electronic Acknowledgement Receipt	
EFS ID:	8303385
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029
Receipt Date:	27-AUG-2010
Filing Date:	27-JAN-2010
Time Stamp:	16:31:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

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Information:					

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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
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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.:	12/695,021	Art Unit:	2617
Filed:	January 27, 2010	Docket No.:	RALEP029
Title:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES		

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	
				Application No.:	12/695,021
Information Disclosure Statement By Applicant				Filing Date	January 27, 2010
				First Named Inventor	Gregory G. Raleigh
(Use as many sheets as necessary)				Art Unit	2617
				Examiner Name	Not Assigned
Sheet	1	of	1	Atty Docket No.	RALEP029

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:	8303666
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029
Receipt Date:	27-AUG-2010
Filing Date:	27-JAN-2010
Time Stamp:	16:34:23
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.)
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Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Filed (SB/08)	RALEP029_IDS_SB08_3.pdf	87665 cf89d64d25d4965502da4939082b1d984e65b7db	no	1
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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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Information:					
9	NPL Documents	RALE_NPL_Ref_3G.pdf	1451509 e95282786ba86e4a05ee8c793a9ec634aa5a654c	no	6
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Information:					
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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.:	12/695,021	Art Unit:	2617
Filed:	January 27, 2010	Docket No.:	RALEP029
Title:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES		

INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §§1.56 AND 1.97(b) BEFORE MAILING OF A FIRST OFFICE ACTION

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P. O. Box 1450
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Respectfully submitted,
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/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.:	12/695,021
				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.	RALEP029

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	

Substitute for form 1449/PTO				*Complete if Known*	
Information Disclosure Statement By Applicant *(Use as many sheets as necessary)*				Application No.:	12/695,021
				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.	RALEP029

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:	8303594
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029
Receipt Date:	27-AUG-2010
Filing Date:	27-JAN-2010
Time Stamp:	16:32:53
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.)
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16	NPL Documents	RALE_NPL_Ref_2N.pdf	2190991 8ba9616337a9da73d1158dfaec561ac7bc23b576	no	219
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Gregory G. Raleigh	Examiner:	Not Assigned
Application No.:	12/695,021	Art Unit:	2617
Filed:	January 27, 2010	Docket No.:	RALEP029
Title:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES		

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:

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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

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/695,021	01/27/2010	Gregory G. Raleigh	RALEP029

CONFIRMATION NO. 7079

21912
VAN PELT, YI & JAMES LLP
10050 N. FOOTHILL BLVD #200
CUPERTINO, CA 95014

PUBLICATION NOTICE



Title:QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES

Publication No.US-2010-0195503-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.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Gregory G. Raleigh	Examiner:	Not Assigned
Application No.:	12/695,021	Art Unit:	2617
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Title:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES		

PRELIMINARY AMENDMENT A

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

Dear Sir:

Prior to the examination of the application on the merits, please amend the application as follows:

AMENDMENTS TO THE ABSTRACT

Please replace paragraph [00157] entitled "Abstract of the Disclosure" with the following paragraph:

[00157] -- Quality of Service (QoS) for Device Assisted Services (DAS) are provided. In some embodiments, QoS for DAS includes providing a wireless communications device configures to determine a QoS request for a service over a wireless network; and verifying the QoS request for the service over the wireless network using one or more verification techniques. --

AMENDMENTS TO THE SPECIFICATION

Please replace paragraph number **[0006]** with the following rewritten paragraph:

[0006] -- Figure 1 illustrates a functional diagram of a network architecture for providing quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. --

Please replace paragraph number **[0007]** with the following rewritten paragraph:

[0007] -- Figure 2 illustrates another functional diagram of another network architecture for providing quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. --

Please replace paragraph **[0008]** with the following rewritten paragraph:

[0008] -- Figure 3 illustrates a functional diagram of another ~~network~~ architecture for including a device based service processor and a service controller for providing quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. --

Please replace paragraph **[0009]** with the following rewritten paragraph:

[0009] -- Figures 4A through 4C illustrates a functional diagram for providing quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. --

Please replace paragraph **[0013]** with the following rewritten paragraph:

[0013] -- Figures 8A through 8C each illustrate[[s]] another flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. --

Please replace paragraph **[0014]** with the following rewritten paragraph:

[0014] -- Figure 9 illustrates another flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. --

Please replace paragraph **[0015]** with the following rewritten paragraph:

[0015] -- Figure 10 illustrates another flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. --

Please replace paragraph **[0016]** with the following rewritten paragraph:

[0016] -- Figure 11 illustrates another flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. --

Please replace paragraph **[0017]** with the following rewritten paragraph:

[0017] --Figure 12 illustrates a device stack for providing various service usage measurement techniques in accordance with some embodiments. --

Please replace paragraph **[0018]** with the following rewritten paragraph:

[0018] -- Figure 13 illustrates another device stack for providing various service usage measurement techniques in accordance with some embodiments. --

Please replace paragraph **[0021]** with the following rewritten paragraph:

[0021] -- As wireless networks, such as mobile networks, evolve towards higher bandwidth services, which can include or require, for example, various levels of Quality of Service (QoS) (e.g., conversational, interactive data, streaming data, and/or various (end-to-end) real-time services that may benefit from QoS), demands will increase for converged network services to facilitate such services for end-to-end services between networks (e.g., to allow for control and/or support for such services, for example, QoS support, across network boundaries, such as between wireless networks (such as various service provider networks) and IP networks (such as the Internet), and/or other networks). While various efforts have attempted to address such QoS needs, such as policy management frameworks for facilitating QoS end-to end solutions, there exists a need to facilitate various QoS requirements using ~~device assisted services~~ Device Assisted Services (DAS). --

Please replace paragraph **[0022]** with the following rewritten paragraph:

[0022] -- Accordingly, Quality of Service (QoS) for Device Assisted Services (DAS) [[are]] is provided. In some embodiments, QoS for DAS is provided. --

Please replace paragraph **[0023]** with the following rewritten paragraph:

[0023] -- To establish a QoS channel, differentiated services are typically available, in which one class/level of service has a higher priority than another to provide for differentiated services on a network, such as a wireless network. For example, in a wireless network, various network elements/functions can be provisioned and controlled to establish a single end or end to end QoS channel. In some embodiments, a centralized QoS policy coordination and decision function using ~~Device Assisted Services (~~DAS~~)~~ techniques to assist in coordinating the QoS channel setup and control among the various elements of a wireless network is provided. --

Please replace paragraph **[0024]** with the following rewritten paragraph:

[0024] -- In some embodiments, QoS channel refers to the logical communication channel connected to a device that provides a desired level of QoS service level. For example, the QoS channel can be created with one or more QoS links, in which each link represents a QoS enabled connection that spans a portion of the total end to end network communication path from a near end device to a far end device. For example, the far end device can be on the same network or on a different network, potentially with different access technology and/or a different access network carrier. In some embodiments, the QoS channel includes one or more QoS links in which each link in the channel is QoS enabled, or one or more of the links in the channel is QoS enabled and others are not. As an example, a QoS channel can include the following links: a first device traffic path link, a first device to access network equipment element ~~link (e.g.~~ link (e.g., 2G/3G/4G wireless base station, WiFi access point, cable network head end, DSLAM, fiber aggregation node, satellite aggregation node, or other network access point/node), a first carrier core network, a long haul IPX network, a second carrier core network, a second device to access network equipment element link, and a second device traffic path link as similarly described herein with respect to various embodiments. --

Please replace paragraph **[0026]** with the following rewritten paragraph:

[0026] -- In some embodiments, a QoS session refers to the QoS enabled traffic for a given device that flows over a QoS channel or QoS link. This QoS traffic supports a QoS service activity. In some embodiments, a QoS service activity includes a device service usage that is requested, configured, or preferably serviced with a given level of QoS. In some embodiments, a device QoS activity is a combination of one or more of the following: application, destination, source, URL or other similar service identifier, service provider, network type, traffic type, content type, network protocol, session type, QoS identifier, time of day, network capacity (e.g., network busy state), user service plan authorization or standing, roaming/home network status, and/or other criteria/measures as similarly described herein. For example, QoS service activities that are supported by QoS sessions can include VOIP traffic, streaming video traffic, differentiated access bandwidth during busy network periods, real-time interactive traffic, such as network connected multimedia meetings (e.g., shared presentations, picture, video, voice, and/or other such applications/services), best effort ~~interactive~~ interactive, such as Internet browsing, time sensitive services, such as email message body delivery, near real time interactive services, such as SMS or push to talk, background download services, such as email downloads and other file transfers (e.g., FTP), and/or truly background download services, such as software updates. --

Please replace paragraph **[0027]** with the following rewritten paragraph:

[0027] -- In some embodiments, various QoS levels or classes are supported. For example a conversation class can provide for real-time traffic, which is typically very delay sensitive but can tolerate bit errors and packet losses. The conversational class is typically used for Voice Over IP (VOIP) and video telephony, in which users of such services benefit from the short delay features of the conversational class[[ )]]. A streaming class is similar to the conversational class except that the streaming class [[is]]typically can tolerate more delay than the conversational class. The streaming class is generally used for when one end of the connection is a user (e.g., human user) and the other end is a machine/computer (e.g., for streaming content applications, such as streaming of video, such as movies or other video content). An interactive class is generally intended for traffic that allows delay variation while requiring reasonably low response time (e.g., web browsing or other applications in which the channel can be unused for long periods of time but when a user makes a request for a new page/data, the response time

should be reasonably low). A background class is generally used for lowest priority service usages (e.g., typically used for e-mail, software updates, and/or other similar applications). In some embodiments, various QoS classes or services are applicable to the conversational class. In some embodiments, various QoS classes or services are also applicable to the streaming class. In some embodiments, various QoS classes or services are also applicable to the interactive class but typically not applicable to the background class. As will now be apparent to one of ordinary skill in the art, various other classes can be provided with lower or higher granularity based on service usage/channel requirements and/or network architectures. --

Please replace paragraph **[0029]** with the following rewritten paragraph:

[0029] -- In some embodiments, a QoS channel is a single ended QoS channel or an end to end QoS channel. For example, if a QoS channel is end to end, then the QoS channel provisioning is accomplished in a coordinated manner for each QoS enabled link in the QoS channel. If a QoS channel is single ended, then the network elements and/or device participate in provisioning as much of one end of the QoS channel as possible, leaving provisioning of the QoS for the other end of the channel as the responsibility of the device and/or network elements that handle the traffic at the other end of the QoS channel. In some ~~embodiments~~ embodiments, a single ended QoS channel includes another single ended QoS channel at the other end. In some embodiments, only one end has single ended QoS channel enablement while the other end of the channel is a best effort service level, which, for example, can be used where one end of the QoS channel has tighter constraints on traffic capacity or quality than the other end (e.g., a VOIP call with one end that is QoS enabled on a 3G wireless network that has relatively tight bandwidth compared to a lightly loaded cable modem network device on the other end which may not need to be QoS enabled in order to achieve adequate voice quality). --

Please replace paragraph [0031] with the following rewritten paragraph:

[0031] --In some embodiments, a service plan refers to the collection of access service capabilities and/or QoS capabilities that are associated with a communications device. In some embodiments, the access and/or QoS capabilities are determined by the collection of access service control policies for the device. In some embodiments, these service control policies are implemented in the network equipment. In some embodiments, these access service control

policies are implemented both in the device and in the network equipment. In some embodiments, these access service control policies are implemented in the device. In some embodiments, there are different levels of service control capabilities (e.g., policies) based on different levels of service plan payments or device standing or user standing. In some embodiments, there are different levels of service control policies based on network type, time of day, network busy status, and/or other criteria/measures as similarly described herein with respect to various embodiments. In some embodiments, the access control and QoS control policies are based on the type of service activity being sought. In some embodiments, the QoS level and access level available for a given service activity for a given device or user is determined by the policies associated with the service plan. In some embodiments, a QoS authorization assessment is performed to determine whether a device or user has sufficient service plan standing to allow the requested level of QoS. --

Please replace paragraph **[0033]** with the following rewritten paragraph:

[0033] -- In some embodiments, the QoS availability assessment is performed after QoS authorization assessment. This prevents the unnecessary exercising of network elements when the device or user does not have sufficient service plan standing to receive the desired level of QoS even if it is available. This can be an important screening function performed on the device in the service processor, or by a centralized network function such as the service controller (e.g., or interchangeably, the home agent (HA), Home Location Register (HLR), Authentication, Authorization, and Accounting (AAA) server/gateway/function, base station, one of the gateways or other network element/function). In some embodiments, QoS availability is assessed without conducting a QoS authorization assessment or before receiving the response to a QoS authorization assessment. --

Please replace paragraph **[0035]** with the following rewritten paragraph:

[0035] -- In some embodiments, device assisted service traffic control and QoS apply readily and directly to the problems of managing a QoS device link for QoS channel provisioning. Accordingly, in some embodiments, a service provider is provided to assist in provisioning the device portion of the QoS channel. In some embodiments, the service processor provisions the device link portion of the QoS channel by placing a higher priority on higher QoS level traffic.

In some embodiments, this QoS priority is implemented in a number of ways, including routing the higher priority QoS traffic into first priority in the downstream and/or upstream traffic queues. Upstream traffic queuing is performed directly in some embodiments by transmitting guaranteed bit rate traffic first at higher available throttling rates, differentiated QoS traffic second with a controlled throttling rate, best effort traffic third with possibly lower controlled throttled rates, and/or background traffic fourth when/if bandwidth not needed by the higher levels of QoS traffic and at lower controlled throttling rates. For example, downstream traffic can be handled by queuing traffic and delaying or preventing TCP acknowledgements to be returned for the lower levels of QoS priority, while immediately passing the traffic and TCP acknowledgements for higher levels of QoS priority. The device link portion of the QoS channel is thus provisioned by assigning policies for the queuing priority, delay, throttle ~~rate~~ rate, and TCP acknowledgement return rate for device traffic in accordance with the bandwidth that is available at any point in time for the device. In some embodiments, various device service processor traffic control capabilities regulate or partially regulate QoS in accordance with a set of network policy instructions, including, in some embodiments, a service plan policy set. --

Please replace paragraph **[0037]** with the following rewritten paragraph:

[0037] Based on the aggregate demand for each traffic QoS class, and the traffic capacity and quality level available to the device, the service processor can adjust the total available bit rate or percentage of available traffic capacity for each QoS class. For example, in some embodiments, the aggregate demand for the real time interactive traffic control class (e.g. services, such as VOIP, emergency communication services or high performance real time competitive gaming) can be determined, and the QoS routing function on the device (e.g., a QoS router agent/function) can first allocate enough constant bit rate traffic capacity from the available traffic capacity to satisfy these services, with each QoS service activity that requires this QoS class being assigned to this QoS channel. As more QoS service activities require this traffic class, the capacity allocated to the QoS channel out of the available device capacity is increased, and when fewer QoS service activities require this traffic class the capacity for this QoS channel is released. In the event that the device does not have any more available capacity with a guaranteed bit rate QoS level, then additional QoS service activities that desire, require or request this QoS level will not be provided this QoS level, and instead will either be provided

with a lower QoS level or will not be allowed to connect to the access network. In some embodiments, there can be a hierarchy among the possible QoS service activities so that if there is no more capacity available at a given service QoS level, then the available capacity for that QoS class is provided to the service activities requiring that QoS from highest priority to lowest, until the available QoS class capacity is consumed, and then one or more QoS service activities that are too low on the priority list to obtain service with that QoS class are either bumped to a lower QoS class or are denied access. In some embodiments, once the required capacity to satisfy the real time constant rate traffic needs is satisfied, the remaining capacity available to the device is then divided among the other QoS channel classes in accordance with a priority policy, with the priority policy being based on the relative priority of each service class, the relative priority of each QoS service activity, or a combination of the relative priority of each QoS service class and each QoS service activity. For example, these relative priority policies can vary from device to device based on service plan selection, device type, user standing, user group, device location, device network connection, type of network, time of day, network busy state, and/or other criteria/measures. --

Please replace paragraph **[0043]** with the following rewritten paragraph:

[0043] --In some embodiments, the near end or originating end device service processor contacts the far end or terminating device service processor to initiate a QoS channel. In some embodiments, the initiation of the QoS channel from the near end or originating device is performed automatically by the far end device when its service processor detects that a given level of QoS is needed for the communication between the two devices. In some embodiments, the near end or originating device service processor detects the need for a QoS channel to the far end or terminating device and contacts a central network resources, such as the service controller (e.g., or other equipment element with similar function for this purpose), and the service controller provisions the far end of the QoS channel, either by communicating directly with the far end device or by communicating with the far end device's service controller (e.g., or other equipment element with similar function for this purpose). In some embodiments, in which the far end device service controller is contacted to assist in provisioning the QoS channel, there is a look up function to determine the address of the far end service controller based on a look up

index formed from some aspect of the far end device credentials ~~(e.g.,~~ (e.g., phone number, SIM [[I.D.]]ID, MEID, IMSI, IP address, user name, and/or other device credentials). --

Please replace paragraph **[0045]** with the following rewritten paragraph:

[0045] -- In some embodiments, local traffic control on the device service processor is combined with traffic control in the link between the device and the access network equipment element. In this manner, both the device traffic control path QoS link and the device to access network element QoS link can be coordinated for best device QoS performance results given the available capacity and quality of the access network traffic for the device. In some embodiments, the policies for how the device manages local traffic control, establishes access network element logical channels (e.g., RABs) and routes traffic to and from the access network element logical channels is all determined by ~~pre-defined~~predefined policy rules loaded onto the device by the service controller (or other equivalent network element). In some embodiments, these policies are determined in the service controller itself. --

Please replace paragraph **[0046]** with the following rewritten paragraph:

[0046] --In some embodiments, a QoS user interface (e.g., QoS UI) is presented to the device user. In some embodiments, the QoS UI notifies the user what level of QoS services the device is authorized to receive based on the service plan selection. In some embodiments, the QoS UI notifies the user what level of QoS services are available on the present network the device is connected to at the present time. In some embodiments, the QoS UI notifies the user when a level of QoS service that is higher than that authorized by the user service plan is required or desirable for a given service activity that the device has initiated. In some embodiments, the QoS UI provides the user with a set of one or more upgrade options to upgrade the service plan to include a higher level of QoS for one or more service activities. In some embodiments, the QoS UI provides the user with an opportunity to specify what level of QoS the user would like to employ for one or more service usage activities. In some embodiments, the QoS UI allows the user to specify a service plan setting that provides differentiated QoS during times when the network is busy. In some embodiments, the QoS UI allows the user to purchase one or more grades of service QoS with either a post-pay for a pre-defined service period and one or more pre-defined service usage limits by QoS class, a pre-pay for one or more pre-defined service

usage limits by QoS class, or another payment system for differentiated QoS services. In some ~~embodiments~~ embodiments, the QoS UI provides the user with an opportunity to QoS enable or pay for QoS services for a connection that is initiated by an incoming connection to the device. --

Please replace paragraph **[0049]** with the following rewritten paragraph:

[0049] -- In some embodiments, the network collects service usage charges for different QoS classes. In some embodiments, there is differentiated service charging for the different classes of QoS service usage. As an example, since guaranteed bit rate traffic consumes network resources whether the traffic capacity is used or not, there can be a time element involved in the charging calculations. As a more detailed example, guaranteed bit rate services can be charged by the total bandwidth provisioned to the device at a given time multiplied by the amount of time that that bandwidth is made available. In some embodiments, differentiated access traffic that has higher QoS than best effort traffic but is not guaranteed bit rate can be charged at a higher rate than best effort traffic but lower than guaranteed bit rate. ~~Such traffic in~~In some embodiments, such traffic can be charged based on the time the QoS channel is made available and the total amount of data transmitted over the channel, or can only be based on the total amount of data transmitted over the channel. Best effort traffic is charged in some embodiments based only on the total amount of data used, with the data charges being less than differentiated streaming access services. Background data services in some embodiments are charged at the lowest rate, possibly with only certain times of the day or periods of low network traffic demand being available for such services, and with the service being based on total data transmitted. In some embodiments, all QoS service levels can be charged based on a fixed price for a fixed charging period, possibly with a service usage cap with additional charges if the service cap is exceeded. In such fixed price scenario embodiments, the price charged is again higher for higher levels of QoS. --

Please replace paragraph **[0050]** with the following rewritten paragraph:

[0050] -- In some embodiments, the network equipment (e.g., access network element, gateways, AAA, service usage storage systems, home agent, HLR, mobile data center, and/or billing systems) record and report service usage for one or more of the QoS service classes used by the device. In some embodiments, the device service processor records and reports service usage for

one or more of the QoS service classes used by the device and reports the QoS service class usage to the service controller (e.g., or another substitute network element). In some embodiments, in which the device is recording reporting usage for one or more QoS service classes, it is important to verify the device service usage reports to ensure that the device usage reports are not distorted, tampered with, and/or otherwise in error. In some embodiments, verifying service usage reports against service usage that should be occurring given the service control policies in place on the device, service processor agent functional operation verification, test service usage events, agent query response sequences, device service processor software protection techniques, device service processor software environment checks, and several other techniques are provides as described herein. For example, using one or more of these verification techniques can provide a verifiable device assisted QoS service usage charging system. --

Please replace paragraph **[0051]** with the following rewritten paragraph:

[0051] -- In some embodiments, device assisted traffic control is provided for managing network congestion as follows. ~~When~~ For example, when a given base station or group of base stations experience traffic demand that is high relative to the available capacity and/or service quality that can be provided, and such a condition is detected by means of network busy state assessment as described below, then a service controller (e.g., or another interchangeable network function) can issue traffic control throttling policies to the devices in accordance with a measure of the excess traffic demand the one or more base stations is experiencing. For example, the device service processors connected to an overly busy base station can be instructed to reduce the traffic control priority for one or more classes of QoS traffic, reducing the queuing priority, throttling rate, delay and/or access allowance for some or all of one or more classes of traffic. As another example, background download processes, such as software updates can be turned off completely or throttled back significantly. As another example, best effort traffic such as Internet browsing can be throttled or reduced for a group of devices connected to base stations experiencing excess traffic demand. As another example, a policy can be implemented on the devices connected to busy base stations in which the device is allowed to browse or conduct other best effort service activities at a relatively high throttling rate for a period of time, but if the device uses more than a certain amount of service (e.g., total data downloaded and/or uploaded)

in a certain period of time then the device may be traffic controlled according to an adaptive throttling policy as described ~~in previous disclosures~~herein. In some embodiments, higher QoS level traffic cannot be throttled in such circumstances, such as VOIP traffic where real time guaranteed bit rate is important to meet user service needs or expectations, while lower priority traffic such as interactive browsing and/or background download are throttled and/or blocked. In some embodiments, the QoS availability assessment processes described herein are adjusted so that higher QoS channels are not provided and provisioned in times or locations in which a given base station or group of base stations experience excess demand or demand above a given threshold. --

Please replace paragraph **[0052]** with the following rewritten paragraph:

[0052] -- In some embodiments, users or devices that have service plans with higher QoS levels, or service plans with higher priority during busy network periods have different traffic control policies applied to them that result in a higher level of traffic performance and/or a higher level of QoS service availability. For example, emergency service workers can be given higher traffic control access policies that result in differentiated services during peak busy times on the network or a portion of the network. In some embodiments, users can obtain a premium service plan for differentiated access during peak busy time periods or may use higher levels of QoS service settings and/or service plans to achieve differentiated service during peak busy periods. As another example, services that demand high levels of QoS classes, such as real time voice services, instant messaging, push to talk, differentiated video streaming, and/or interactive gaming, are not traffic controlled to the same extent that other lower priority services or lower class service plans are traffic controlled during peak busy times. For example, this type of service differentiation can also be applied based on device type, user group, user standing, user reward zone points, and/or other criteria/measures as similarly described herein. --

Please replace paragraph **[0053]** with the following rewritten paragraph:

[0053] -- In some embodiments, the decision to reduce the access traffic control settings as described above is made by the device service processor based on the device's assessment of the network capacity, which can be determined using various techniques as described herein. In some embodiments, the decision to reduce the access traffic control settings as described above

is made by a service controller (e.g., or other interchangeable network equipment element or elements as described herein) connected to the device that provides instructions to the device to adjust the access policy settings. For example, the service controller can obtain the network capacity information from access equipment elements, from device reports of traffic capacity and/or quality as described herein, or from reports on traffic capacity and/or quality obtained from dedicated devices used for the purpose of assessing network capacity. In some embodiments, the decision to reduce the access traffic control settings as described above is based on the time of day or day of week or both to accommodate cyclical patterns in network capacity and traffic demand. --

Please replace paragraph **[0054]** with the following rewritten paragraph:

[0054] -- In some embodiments, a service controller (e.g., or another interchangeable network equipment element or elements, as described ~~elsewhere~~herein) assesses network busy state and then controls device traffic demand by reducing the offered capacity for one or more service classes supported by the access network equipment elements, such as a wireless base station. In such embodiments, the service controller (e.g., or similar function) gathers the network capacity information with one of the techniques described herein and instructs one or more of the access network equipment elements to reduce the offered capacity for one or more levels of service QoS, to one or more of the devices connected to the access network equipment elements. For example, the determination of which devices to throttle back can be made based on an equal throttling of all devices of a given service plan status, or based on the device traffic usage patterns in the recent past as described herein, or based on a combination of service plan status and recent traffic usage patterns. --

Please replace paragraph **[0056]** with the following rewritten paragraph:

[0056] -- In some embodiments, [[the]] a QoS service control policy is adapted as a function of the type of network the device is connected to. For example, the QoS traffic control policies and/or the QoS service charging policies can be different when the device is connected to a wireless network (e.g., a 3G/4G network where there is in general less available QoS enabled traffic capacity) than when the device is connected to a wired network (e.g., a cable or DSL network where there is in general a higher level of QoS capacity available). In such

embodiments, the device service processor and the service controller can coordinate to adapt the QoS service control policies and/or the QoS service charging policies to be different depending on which network the device is connected to. Similarly, the device QoS service control policy and/or QoS service charging policy can also be adapted based on whether the device is connected to a home wireless network or a roaming wireless network. --

Please replace paragraph **[0058]** with the following rewritten paragraph:

[0058] -- **Figure 1** illustrates a functional diagram of a network architecture for providing quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS techniques described herein are implemented using the network architecture shown in Figure 1. --

Please replace paragraph **[0065]** with the following rewritten paragraph:

[0065] -- In some embodiments, 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 apparatus/systems 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 provides 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 and embodiments 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]]127 ~~(also~~ e.g., 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 in Figure 1, 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. --

Please replace paragraph **[0067]** with the following rewritten paragraph:

[0067] -- 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/assisted service usage information (e.g., micro-CDRs) for one or more devices on the wireless network (e.g., devices 100); and provides the device generated service 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, as described herein, the CDR storage, aggregation, mediation, feed 118 collects/receives micro-CDRs for one or more devices on the wireless network (e.g., devices 100). 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 service usage information. In some embodiments, the network device is a CDR feed aggregator, and the

CDR storage, aggregation, mediation, feed 118 ~~(and/~~ (e.g., or other network elements and/or various combinations of network elements) also aggregates (network based) CDRs and/or micro-CDRs for the one or more devices on the wireless network; applies a set of rules to the aggregated CDRs and/or micro-CDRs using a rules engine (e.g., bill by account, transactional billing, revenue sharing model, 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, a revenue sharing platform is provided using various techniques described herein. --

Please replace paragraph **[0068]** with the following rewritten paragraph:

[0068] -- In some embodiments, the CDR storage, aggregation, mediation, feed 118 ~~(and/~~ (e.g., or other network elements and/or various combinations of network elements) communicates a new set of CDRs (e.g., aggregated and mediated CDRs and/or micro-CDRs that are then translated into standard CDRs for a given wireless network) for the one or more devices on the wireless network to a billing interface (e.g., central billing interface 127) or a billing system (e.g., central billing system 123). In some embodiments, the CDR storage, aggregation, mediation, feed 118 ~~(and/~~ (e.g., or other network elements and/or various combinations of network elements) communicates with a service controller (e.g., service controller 122) to collect the device generated service usage information (e.g., micro-CDRs) 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/~~ (e.g., or other network elements and/or combinations of network elements) communicates the device generated service usage information to a billing interface or a billing system. In some embodiments, the CDR storage, aggregation, mediation, feed 118 ~~(and/~~ (e.g., or other network elements and/or various combinations of network elements) communicates with a transport gateway and/or a Radio Access Network (RAN) gateway to collect the network generated/based service usage information for the one or more devices on the wireless network. In some embodiments, the service controller 122 communicates the device assisted service usage

information (e.g., micro-CDRs) to the CDR storage, aggregation, mediation, feed 118 ~~(and/~~ (e.g., or other network elements and/or various combinations of network elements). --

Please replace paragraph **[0080]** with the following rewritten paragraph:

[0080] -- In some embodiments, QoS for DAS includes a service processor (e.g., any device assisted element/function) that facilitates coordination for and/or provisions wireless access/radio access bearers (e.g., RABs). In some embodiments, the service processor determines whether a request for QoS is authorized (e.g., according to QoS service level, user standing, available local network capacity (e.g., as reported by other device(s) and/or network)). In some embodiments, device QoS capacity demand reports provide and/or augment network capacity demand reports.--

Please replace paragraph **[0082]** with the following rewritten paragraph:

[0082] -- In some embodiments, QoS for DAS provides for device assisted monitoring, information, and/or functionality to facilitate QoS without and/or to assist network based monitoring, information, and/or functionality (e.g., Deep Packet Inspection (DPI) and/or provides such monitoring, information, and/or functionality that may not be available via network based monitoring, information, and/or functionality (e.g., encrypted activities on the device may not be accessible by DPI or other network based techniques). For example, QoS for DAS can assist in the QoS setup to facilitate the QoS setup and provide such information that may not otherwise be available using network based only techniques. For example, device assisted activity and/or service monitoring techniques can assist in classifying the QoS for the monitored activity and/or service using, for example, a QoS activity map (e.g., as described herein or other similar techniques). For example, using such device assisted techniques eliminates and/or minimizes DPI or other network based techniques that can give rise to privacy concerns/issues, network neutrality concerns/issues, and/or otherwise may not be able to provide similar or equivalent granular service/activity monitoring, as discussed above, and/or also off loads such processing from the network (e.g., network elements/devices/functionality) to the communications devices (e.g., at least for such communications devices that can perform such functions, based on their processing and/or memory capabilities, as would be apparent to one of ordinary skill in the art). In some embodiments, QoS for DAS includes the service provider for providing an initial authorization/clearance for a QoS request (e.g., using various techniques

described herein), and the service controller determines if the QoS request should be authorized (e.g., based on various QoS authorization/clearance/approval criteria (~~such as~~e.g., QoS activity maps and/or QoS request rule) and/or network capacity, as described herein). In some embodiments, QoS for DAS includes the service provider for providing a QoS request including a QoS class to the service controller, and the service controller determines if the QoS request should be authorized, as described herein. --

Please replace paragraph **[0093]** with the following rewritten paragraph:

[0093] -- In some embodiments, the communications device (e.g., the service processor) maintains a QoS flow table that associates or maps device activity to QoS level/class to RAB/QoS channel, [[and]] and, in some embodiments, the communications device also informs a QoS management network function/element of the relative priority of the QoS flows for the communications device (e.g., based on or using the QoS flow table). In some embodiments, the service controller receives or collects information from the communications device and maintains such a QoS flow table for the communications device and in some embodiments, the service controller also informs a QoS management network function/element of the relative priority of the QoS flows for the communications device (e.g., based on or using the QoS flow table). In some embodiments, flows can be assigned to activities originating at the communications device in a transparent way, or simply by activity class or user preference, or using other techniques. --

Please replace paragraph **[0097]** with the following rewritten paragraph:

[0097] -- In some embodiments, QoS charging is based on QoS channel/reservation, service flow, or RAB charging (e.g., single flow per RAB, multi-flow per RAB, multi-RAB per flow). In some embodiments, charging is based on one or more of the following: user service class request, traffic volume and class, time and class, network capacity (e.g., network busy state) and class, time of day and class, location, traffic type, application type, application class, destination, destination type, partner service, and/or other criteria/measures. In some embodiments, QoS charging is verified using the various verification techniques described herein (e.g., test charging events). In some embodiments, QoS charging is by data usage (e.g., by Megabyte (MB)), service flow by time by QoS class, speed by time, and/or other criteria/measures. --

Please replace paragraph **[0099]** with the following rewritten paragraph:

[0099] -- Figure 2 illustrates [[a]] another functional diagram of another network architecture for providing quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS techniques described herein are implemented using the network architecture shown in Figure 2. --

Please replace paragraph **[00100]** with the following rewritten paragraph:

[00100] -- As shown, Figure 2 includes various devices 100 including service processors 115. For example, devices 100 can include various types of mobile devices, such as phones, PDAs, computing devices, laptops, ~~netbooks~~net books, tablets, cameras, music/media players, GPS devices, networked appliances, and any other networked device; and/or devices 100 can include various types of intermediate networking devices, as described herein. The devices 100 are in communication with service control 210 and central provider access and core networks 220. Service policies and accounting functions 230 are also provided in communication with the central provider access and core networks 220. For example, devices 100 can communicate via the central provider access and core networks 220 to the Internet 120 for access to various Internet sites/services 240 (e.g., Google sites/services, Yahoo sites/services, Blackberry services, Apple iTunes and AppStore, Amazon.com, FaceBook, and/or any other Internet service or other network facilitated service). --

Please replace paragraph **[00105]** with the following rewritten paragraph:

[00105] -- For example, [[this]]the architecture 300 provides a 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 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 3 are described below with respect to Figures 10 and 11. --

Please replace paragraph **[00109]** with the following rewritten paragraph:

[00109] -- As shown in Figure 3, the service controller 122 includes an access control integrity server 1654 (e.g., service policy security server). In some embodiments, the access control integrity server 1654 collects device information on service policy, service usage, agent ~~configuration~~ 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. --

Please replace paragraph **[00110]** with the following rewritten paragraph:

[00110] -- In some embodiments, the access control integrity server 1654 (e.g., and/or some other agent of service controller 122) acts on access control integrity agent 1694 (e.g., service policy security agent) 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. --

Please replace paragraph **[00111]** with the following rewritten paragraph:

[00111] -- In some embodiments, the access control integrity server 1654 (e.g., 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 QoS data passed, QoS 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. --

Please replace paragraph **[00115]** with the following rewritten paragraph:

[00115] -- 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 the 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. --

Please replace paragraph **[00116]** with the following rewritten paragraph:

[00116] -- As shown in Figure 3, 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~~ some 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~~policies. In

~~other~~some 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. --

Please replace paragraph **[00117]** with the following rewritten paragraph:

[00117] -- As shown in Figure 3, Service Analysis, Test & Download 122B ~~service controller 122~~ includes a beta test server 1658 (e.g., policy creation point and beta test server). 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. --

Please replace paragraph **[00118]** with the following rewritten paragraph:

[00118] -- As shown in Figure 3, service controller 122 includes a service download control server 1660 (e.g., a service software download control server). 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. --

Please replace paragraph **[00120]** with the following rewritten paragraph:

[00120] -- As shown in Figure 3, the Access Network HLR 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 the device service history 1618). --

Please replace paragraph **[00123]** with the following rewritten paragraph:

[00123] -- As shown in Figure 3, in some embodiments, modem selection and control 1811 (e.g., in communication with connection manager 1804 as shown) 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 (e.g., 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 (e.g., potentially for higher service payments) than other users). As another example, ambient services (e.g., as similarly described herein) can be provided for the hotspot for verified service processors. --

Please replace paragraph **[00124]** with the following rewritten paragraph:

[00124] -- 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 (e.g., 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. --

Please replace paragraph **[00125]** with the following rewritten paragraph:

[00125] -- As shown in Figure 3, 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 3, 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~~ 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. --

Please replace paragraph **[00126]** with the following rewritten paragraph:

[00126] -- As shown in Figure 3, service processor 115 includes a QoS API and OS stack interface 1693. In some embodiments, QoS API and OS stack interface 1693 provides the QoS API functionality as similarly described herein with respect to various embodiments. In some embodiments, the QoS API is used to report back QOS availability to applications. As shown, service processor 115 also includes a QoS router 1698 (e.g., a QoS router agent/function) and a policy decision point (PDP) agent 1692. In some embodiments, QoS router 1698 provides the QoS router functionality as similarly described herein with respect to various embodiments. In some embodiments, the QoS router supports multiple QoS channels (e.g., one or more provisioned/allocated QoS links forming a QoS channel between the device and the desired end point, such as an access point/BTS/gateway/network for a single ended QoS channel or other communication device for an end to end QoS channel, depending on the QoS connection/network support/availability/etc.). In some embodiments, the QoS router supports multiple QoS channels, which can each have different QoS classes/levels. In some

embodiments, the QoS router routes application/service usage traffic to an appropriate QoS channel. In some embodiments, the QoS router determines the routing/mapping based on, for example, one or more of the following: a QoS API request, a QoS activity map, a user request, a service plan, a service profile, service policy settings, network capacity, service controller or other intermediate QoS network element/function/device, and/or any other criteria/measure, as similarly described herein with respect to various embodiments. In some embodiments, multiple different applications/services are routed to a particular QoS channel using various techniques described herein. In some embodiments, different applications/services are routed to different QoS channels using various techniques described herein. In some embodiments, the QoS router assists in managing and/or optimizing QoS usage for the communications device. In some embodiments, the QoS router assists in managing and/or optimizing QoS usage across multiple communications devices (e.g., based on network capacity for a given cell area/base station or other access point). In some embodiments, PDP agent 1692 provides the PDP agent functionality as similarly described herein with respect to various embodiments. As shown, QoS for DAS architecture 300 also includes a suspend resume interface 320, network QoS provisioning interfaces [[300]]330~~in the device service processor 115~~; and an activation/suspend resume server 340 and billing ~~event~~ interface server 350 in the service controller [[122]]122A; and a suspend/resume interface 320 and network QoS provisioning interfaces 330 for providing the various QoS techniques described herein. --

Please replace paragraph **[00128]** with the following rewritten paragraph:

[00128] -- 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 (e.g., 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 (e.g., 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 1663 as shown in Figure [[16]] 3. 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. --

Please replace paragraph **[00129]** with the following rewritten paragraph:

[00129] -- Figures 4A through 4C illustrates a functional diagram for providing quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS techniques described herein are implemented using the network architecture shown in Figures 4A through 4C. --

Please replace paragraph **[00130]** with the following rewritten paragraph:

[00130] -- Referring to Figure 4A, in some embodiments, QoS functionality is performed at the communications device 100 using service processor 115 as similarly described herein. For example, the service processor 115 determines whether or not a QoS request is authorized (e.g., based on the associated service plan and/or other criteria/measures). If the QoS request is authorized, then the service processor 115 communicates with the base station (BTS) 125 to send the QoS request (e.g., a RAB or multi-RAB reservation request) to the local BTS. The BTS ~~request~~ determines ~~with~~ whether to accept or deny the QoS request (e.g., based on network capacity, such as using a first come first service QoS/network bandwidth or best effort access policy or other techniques, and/or other criteria/measures). The BTS responds to the QoS request accordingly. If the QoS request is granted, the QoS session can be initiated as similarly described herein. In some embodiments, the service processor 115 also performs various QoS charging functions using various techniques described herein, and the service processor 115 periodically sends QoS charging records or reports to the service controller 122. In some

embodiments, the service processor 115 and the QoS related functions performed by the service processor 115 are periodically verified using the various techniques described herein. --

Please replace paragraph **[00132]** with the following rewritten paragraph:

[00132] -- Referring to Figure 4C, at 410, the service processor 115 sends a QoS request to the service controller 122 (e.g., the service processor can also (at least in part) determine whether the QoS request is authorized as similarly described with respect to Figure 4A). At 420, the service controller 122 sends the QoS request to the BTS 125 if it is determined that the QoS request is authorized using various techniques described herein and/or whether the BTS 125 has network capacity for the QoS request. For example, the service controller can provide a central policy decision point function for QoS related activities (e.g., based on QoS prioritization, network capacity, and/or other criteria/measures/policies). At 430, the service controller 122 communicates the response to the QoS request accordingly. At 440, if the QoS request was approved, the device 100 initiates the QoS session (e.g., using a RAB or multi-RAB reservation) via the BTS 125. In some embodiments, the service processor 115 also performs various QoS charging functions using various techniques described herein, and the service processor 115 periodically sends QoS charging records or reports to the service controller 122. In some embodiments, the service processor 115 and the QoS related functions performed by the service processor 115 are periodically verified using the various techniques described herein. --

Please replace paragraph **[00134]** with the following rewritten paragraph:

[00134] -- In some embodiments, the device determines QoS availability by directly querying [[QOS]]QoS link reservation equipment in the network (e.g., an access point, such as the BTS 125). In some embodiments, the device determines QoS availability based on an intermediate network function that coordinates QoS requests with one or more network QoS link resources. In some embodiments, the device requests a QoS reservation in advance of [[QOS]] QoS link establishment with one or more QoS network link resources. In some embodiments, in response to a QoS request, a QoS channel is reported as available only if/after it is determined that the necessary one or more QoS links required to create the [[QOS]]QoS channel are available, and, for example, the QoS channel can then be reserved based on a confirmation or automatically be reserved in response to the QoS request. --

Please replace paragraph **[00135]** with the following rewritten paragraph:

[00135] -- Figure 5 illustrates a functional diagram for generating a QoS activity map for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In particular, Figure 5 illustrates techniques for mapping a service plan or a set of service plan policies/rules for QoS 510 to a set of QoS activity rules 530. As shown, a set of QoS rules/QoS related device state information 510 (e.g., a set of associated service plan, service plan usage, other state such as network capacity or forecasted demand or time of day/day of week, activity usage, QoS level, and/or user preferences) is mapped using a QoS mapping function [[to a]] to a set of QoS activity rules 530 using various techniques described herein. At 530, activity rules (e.g., activity policy rules instructions) 530 are determined using the mapping function 520. --

Please replace paragraph **[00136]** with the following rewritten paragraph:

[00136] -- In some embodiments, the service plan includes a list of activity policies, and each activity policy in the service plan specifies how the activity policy is modified by rules state information. In some embodiments, each activity policy then becomes the instruction for the engine (e.g., QoS mapping function 520) that maps the activity policy to QoS activity rules 530. In some embodiments, service controller 122 downloads QoS mapping function 520, which is implemented by service processor 115. --

Please replace paragraph **[00139]** with the following rewritten paragraph:

[00139] --Figure 6 illustrates a functional diagram for quality of service (QoS) for device assisted services for an end to end coordinated QoS service channel control in accordance with some embodiments. As shown in Figure 6, a wireless communications device 100A includes a service processor 115A in secure communication with service controller 122A. A wireless communications device 100B includes a service processor 115B in secure communication with service controller 122B. In some embodiments, when, for example, device 100A initiates a QoS request for a QoS class session in communication with device 100B (e.g., a VOIP call or another application service requiring or possibly using a QoS class/level session, such as a conversational or other QoS type of class/level), as sequence of actions are performed using service controller 122A and service controller 122B to facilitate/setup an end to end coordinated QoS service

channel control. In some embodiments, as similarly described herein, assuming that service processor 115A and service controller 122A determine that the QoS request from device 100A is authorized for that device, then the service controller 122A contacts registry 650 (e.g., a device registry, such as an HLR, mobile services center, or other central database or registry including, for example, service controller mappings by device/IP address/other) to determine the service controller associated with/responsible for managing QoS/service control for device 100B. The registry 650 provides the service controller 122B information (e.g., IP address/other address) based on this lookup determination. In some embodiments, service controller 122A then initiates the QoS request with service controller 122B to determine if the device 100B is authorized and/or available for the QoS session requested by device 100A. In some embodiments, service controllers ~~122A/B~~ 122A and 122B communicate with BTSs 125A/B to determine whether the QoS request can be facilitated (e.g., based on network capacity) as similarly described herein. In some embodiments, the service controllers ~~122A/B~~ 122A and 122B provide the central QoS coordination function and can request appropriate QoS channels directly from the respective local BTSs. In some embodiments, the service controllers ~~122A/B~~ 122A and 122B also communicate with one or more of the following network elements/functions as shown in Figure 6 in order to facilitate an end to end coordinated QoS service channel control: RAN 610/670, Core Network 620/660, and IPX network 630. In some embodiments, service controllers ~~122A/B~~ 122A and 122B communicate with various necessary network ~~element~~ elements for provisioning to facilitate session provisioning through the carrier core network as similarly discussed above. In some embodiments, service controllers ~~122A/B~~ 122A and 122B communicate with various necessary network ~~element~~ elements for provisioning to facilitate session provisioning through the IPX network as similarly discussed above. As will be apparent to one of ordinary skill in the art, QoS for DAS techniques as described herein can be similarly implemented using these or similar techniques to various other network architectures. --

Please replace paragraph **[00140]** with the following rewritten paragraph:

[00140] -- Figure 7 illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. At 702, the process begins. At 704, QoS rules are received or determined (e.g., a service processor receives or requests the QoS rules, which may be included in service plan, service profile, and/or service policy settings

associated with the communications device). In some embodiments, the QoS rules are verified using various techniques as described herein (e.g., periodically updated, replaced, downloaded, obfuscated, and/or tested using by a service controller and/or using other verification techniques). In some embodiments, a QoS API is also used by various applications to initiate a QoS request, as described herein with respect to various embodiments. In some embodiments, the QoS rules are implemented in the form of a QoS activity map in accordance with various embodiments described herein. At 706, the communications device's standing for QoS is determined using various techniques described herein (e.g., based on the service plan, service profile, service policy settings, QoS rules, based on QoS class, current service usage, current billing standing, and/or any other criteria/measure). In some embodiments, in addition to ~~verify~~ verifying the device/user standing for the QoS request, whether the device is following or in compliance with an assigned QoS reservation request policy is also verified using various techniques described herein. If the device is determined to not be eligible for QoS, then at 708, the device User Interface (UI) provides information concerning the denial/ineligibility for QoS session(s) (e.g., denial/ineligibility explanation and/or options for providing for one or more QoS options, such as a service plan upgrade or payment for a certain/set of/period of time for QoS session(s) access). If the device is determined to be eligible for QoS, then at 710, QoS availability is determined (e.g., based on network capacity, which may be determined at the device, via communication with the service controller, via communication with the BTS, and/or any combination thereof, using the various techniques described herein). If QoS is determined to not be available, then at 712, the UI provides information and/or options concerning the QoS availability (e.g., unavailability explanation and/or options for providing for one or more QoS options, such as a service plan upgrade or payment for a certain/set of/period of time for QoS session(s) access). If QoS is determined to be available, then at 714, a request for network resources for the QoS session is sent to one or more network resources (e.g., service controller, BTS, gateway, core/transport network, IPX/GRX networks, and/or other network elements/functions/resources). At 716, a confirmation of the approved QoS session is received to close the loop for the QoS for DAS (e.g., a QoS schedule is received that provides the QoS session confirmation information, such as a scheduled RAB/multi-RAB and/or other reserved network resource(s) by schedule/other criteria). At 718, one or more verification techniques are performed to verify the QoS for DAS implementation on the device using various verification

techniques described herein (e.g., comparing QoS service usage reports from a network source with the associated device policy; comparing QoS service usage reports from a network source with the QoS service usage reports from the device, and/or using other verification techniques as similarly described herein). At 720, the process is completed. --

Please replace paragraph **[00141]** with the following rewritten paragraph:

[00141] -- Figures 8A through 8C each illustrate another flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. **Figure 8A** illustrates [[a]] another flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. At 802, the process begins. In some embodiments, the QoS policies are implemented on the device (e.g., service processor collects/receives an associated service plan that defines/specifies basic policies for QoS, which can include a QoS activity map, which, for example, maps QoS classes based on application, service usage, flow type, destination, time of day, network capacity, and/or other criteria/measures, as similarly described herein). In some embodiments, a QoS API is also used by various applications to initiate a QoS request, as described herein with respect to various embodiments. In some embodiments, the QoS rules are implemented in the form of a verified QoS activity map in accordance with various embodiments described herein. At 804, a QoS request is determined (e.g., by QoS class for a particular associated service/application). In some embodiments, the QoS request is determined at least in part by using the QoS activity map using various techniques described herein, for example, based on service/application usage monitoring on the device (e.g., by the service processor service usage monitoring agent). In some embodiments, the QoS request is determined based on the QoS API. In some embodiments, the QoS request is determined to be associated with an outgoing connection or an incoming connection. At 806, whether the QoS request is authorized is determined (e.g., whether the QoS request supported by the service plan, sufficient charging credit exists for this QoS request, and/or other criteria/measures). If not, then at 808, the UI provides a responsive notification and/or option as similarly described herein. If the QoS request is approved, then at 810, a request for network resources for the QoS session is sent to one or more network resources (e.g., service controller, BTS, gateway, core/transport network, IPX/GRX networks, a/another service controller in communication with another communications device such as for setting up a

conversational class QoS connection with the other communications device, and/or other network elements/functions/resources). If the device is determined to be eligible for QoS, then at 810, QoS availability is determined (e.g., based on network capacity, which may be determined at the device, via communication with the service controller, via communication with the BTS, and/or any combination thereof, using the various techniques described herein). If QoS is determined to not be available, then at 812, the UI provides information and/or options concerning the QoS availability (e.g., unavailability explanation and/or options for providing for one or more QoS options, such as a service plan upgrade or payment for a certain/set of/period of time for QoS session(s) access). If QoS is determined to be available, then at 814, a request for network resources for the QoS session is sent to one or more network resources (e.g., service controller, BTS, gateway, core/transport network, IPX/GRX networks, and/or other network elements/functions/resources, to setup, for example, a QoS end to end connection – coordinate all resources end to end for the approved and verified QoS flow). At 816, a confirmation of the approved QoS session is received to close the loop for the QoS for DAS (e.g., a QoS schedule is received that provides the QoS session confirmation information, such as a scheduled RAB/multi-RAB and/or other reserved network resource(s) by schedule/other criteria). At 818, a QoS router is executed/performed on the communications device to assist in implementing QoS for DAS using various verification techniques described herein (e.g., to perform QoS queuing, throttling, and/or other QoS router related functions as described herein). At 820, verified QoS charging is performed (e.g., at least in part) on the device using various techniques described herein (e.g., using the service processor, such as the charging/service usage monitoring and/or other agents as described herein). In some embodiments, QoS charging records and/or reports are provided to one or more network elements for managing QoS billing and/or other QoS management/billing related service control functions (e.g., to the service controller and/or the billing interface or billing server). In some embodiments, QoS for DAS also facilitates reestablishing the QoS session/connection/channel/stream if the QoS session/connection/channel/stream is lost or goes down, using similar techniques to those described herein as would be apparent to one of ordinary skill in the art. At 822, the process is completed. In some embodiments, the QoS provisioning channel is closed when the device session is over to, for example, free up various resources. --

Please replace paragraph **[00142]** with the following rewritten paragraph:

[00142] -- Figure 8B illustrates [[a]] another flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS includes identifying the QoS requirements (e.g., QoS level or QoS class) for a service activity. At 824, the process begins. In some embodiments, the QoS policies are implemented on the device (e.g., service processor collects/receives an associated service plan that defines/specifies basic policies for QoS, which can include a QoS activity map, which, for example, maps QoS classes based on application, service usage, flow type, destination, time of day, network capacity, and/or other criteria/measures, as similarly described herein). In some embodiments, the QoS rules are implemented in the form of a verified QoS activity map in accordance with various embodiments described herein. At 826, the device monitors device activity, such as service/application usage activities. In some embodiments, the device detects the relevant activities based on various service usage monitoring techniques described herein. At [[828,a]] 828, a QoS request is determined, for example, using various techniques described herein. At 830, a QoS level is determined based on the application associated with the QoS request using various techniques described herein. For example, the QoS level can be determined using the QoS activity map, which provides a QoS policy defined by a table associating various QoS levels with a variety of activities that include various device monitored service usage/application activities. In some embodiments, the QoS activity map includes QoS level mappings based on one or more of the following: application, destination/source, traffic type, connection type, content type, time of day/day of week, network capacity, activity usage, service plan selection, current standing, user class, device class, home/roaming, network capabilities, and/or other criteria/measures as similarly described herein. In some embodiments, at 832, if the QoS level cannot be determined and/or in order to confirm a QoS level or selection among multiple potential appropriate/approved QoS levels, the UI presents options for a user to select the QoS level. At 834, the QoS request is initiated for the determined QoS level (e.g., QoS class). At 836, the process is completed. --

Please replace paragraph **[00143]** with the following rewritten paragraph:

[00143] -- **Figure 8C** illustrates [[a]]another flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS includes determining whether the network should grant the QoS request for a given device

activity. At 842, the process begins. At 844, QoS request is determined. At 846, the communications device's standing for QoS is determined using various techniques described herein (e.g., a service processor in combination with a service controller or based on a communication for authorization of the QoS request sent to the service controller determines whether the QoS request is authorized, which can be based on the service plan, service profile, service policy settings, QoS rules, based on QoS class, current service usage, current billing standing, and/or any other criteria/measure). If the device is determined to not be eligible for QoS, then at 848, the device User Interface (UI) provides information concerning the denial/ineligibility for QoS session(s) (e.g., denial/ineligibility explanation and/or options for providing for one or more QoS options, such as a service plan upgrade or payment for a certain/set of/period of time for QoS session(s) access). If the device is determined to be eligible for QoS, then at 850, QoS availability is determined (e.g., based on network capacity, which may be determined at the device, via communication with the service controller, via communication with the BTS, and/or any combination thereof, using the various techniques described herein). If QoS is determined to not be available, then at 852, the UI provides information and/or options concerning the QoS availability (e.g., unavailability explanation and/or options for providing for one or more QoS options, such as a service plan upgrade or payment for a certain/set of/period of time for QoS session(s) access). If QoS is determined to be available, then at 854, a request for network resources for the QoS session is sent to one or more network resources (e.g., service controller, BTS, gateway, core/transport network, IPX/GRX networks, and/or other network elements/functions/resources can be queried directly and/or a centralized QoS resource/network function/element/database can be queried for determining such network resources and coordinating such scheduling). At 856, a confirmation of the approved QoS session is received to close the loop for the QoS for DAS (e.g., a QoS schedule is received that provides the QoS session confirmation information, such as a scheduled RAB/multi-RAB and/or other reserved network resource(s) by schedule/other criteria). At 858, a QoS router is performed. In some embodiments, the QoS router is performed on the device (e.g., service processor), on a network element/function (e.g., service controller), and/or in combinations thereof. In some embodiments, the QoS router prioritizes multiple QoS requests across a given communications device. In some embodiments, the QoS router prioritizes multiple QoS requests across multiple communications devices and/or across multiple BTSs. In some embodiments, the QoS router

performs various QoS class degradation, promotion, and/or other throttling related techniques as similarly described herein (e.g., based on session priority, network capacity, workload balancing, QoS priority rules, and/or other criteria/measures/rules). At 860, the process is completed. --

Please replace paragraph **[00144]** with the following rewritten paragraph:

[00144] -- Figure 9 illustrates [[a]]another flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS includes QoS session provision for a service activity. At 902, the process begins. At 904, a new QoS session is granted and/or confirmed. At 906, a device service processor (e.g., policy decision point (PDP) agent, also referred to herein as a policy control agent) maps the QoS session grant to a QoS monitoring policy (e.g., based on a service controller provided QoS related policy, based on a service plan associated with the device, user, device/user group, and/or other criteria/measures, as similarly described herein). At 908, the QoS monitoring policy provides commands/instructions to a policy enforcement point (PEP) (e.g., PEP agent, also referred to herein as a policy implementation agent) for managing/enforcing the new QoS priorities/sessions. At 910, the PEP determines whether to allow, block, throttle, and/or queue priority a session based on the QoS monitoring policy. At 912, the process is completed. --

Please replace paragraph **[00145]** with the following rewritten paragraph:

[00145] -- Figure 10 illustrates [[a]]another flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, Radio Access Bearer (RAB) support is available, and the following process is performed in accordance with some embodiments. At 1002, the process begins. At 1004, the device service processor detects a QoS request or QoS need (e.g., a QoS API request, a QoS request or need/benefit of QoS session based on service usage monitoring, such as by application, or other service usage measure/activity). At 1006, the service processor and/or the service processor in communication with the service controller determines if the service plan allows/supports the requested QoS. If not, then at 1008, a UI event is generated (e.g., notifying the device user that such QoS/QoS level/class is not available, and potentially offering a QoS/service plan upgrade/purchase for that QoS/QoS level/class). At 1010, the service processor communicates the QoS request to the service controller (e.g., using a secure service control link or secure communication channel, as

similarly described herein) to request the QoS level/class. At 1012, the service controller determines whether network resources are available using various techniques as described herein. In some embodiments, network capacity is determined using various techniques, such as local device measurements; dedicated local device measurement reports; BTS reports; other network element reports; by assessing, for example, a combination of one or more of available bandwidth, traffic delay or latency, available QoS level, variability in available bandwidth, variability in latency, and/or variability in available QoS level; and/or other techniques as described herein. At 1014, the service controller responds to the QoS request (e.g., grants or denies the QoS request). In some embodiments, another UI event is generated if the QoS request is denied as similarly described herein. At 1016 (assuming the QoS request is granted), the device requests a QoS channel from the BTS. In some embodiments, the request includes a QoS request authorization code received from the service controller. In some embodiments, the service controller provides a notification of the QoS request approval for the communications device to the BTS, so that the BTS can verify the approval of the QoS request. In some embodiments, the BTS confirms the device QoS channel request directly with the service controller. For example, various other techniques for verifying the QoS channel request can also be used as similarly described herein and as would be apparent to one of ordinary skill in the art. In some embodiments, the device service processor and/or service controller provides QoS related reports informing the BTS of how many QoS channels (e.g., RABs) to provision and how many best effort resources to provision based on device demand projections. At 1018 (assuming the QoS channel request is verified), the QoS session is initiated based on an allocated RAB or multi-RAB reservation received from the BTS (e.g., and/or other network elements as similarly described herein). At 1020, the process is completed. --

Please replace paragraph **[00146]** with the following rewritten paragraph:

[00146] -- Figure 11 illustrates [[a]]<u>another</u> flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, RAB support is not available, and the following process is performed in accordance with some embodiments. At 1102, the process begins. At 1104, the device service processor detects a QoS request or QoS need (e.g., a QoS API request, a QoS request or need/benefit of QoS session based on service usage monitoring, such as by application, or other service usage

measure/activity). At 1106, the service processor and/or the service processor in communication with the service controller determines if the service plan allows/supports the requested QoS. If not, then at 1108, a UI event is generated (e.g., notifying the device user that such QoS/QoS level/class is not available, and potentially offering a QoS/service plan upgrade/purchase for that QoS/QoS level/class). At 1110, the service processor communicates the QoS request to the service controller (e.g., using a secure service control link or secure communication channel, as similarly described herein) to request the QoS level/class. At 1112, the service controller determines whether network resources are available using various techniques as described herein. In some embodiments, network capacity is determined using various techniques, such as local device measurements, BTS reports, other network element reports, and/or other techniques as described herein. In some embodiments, the service controller throttles other devices on the link so that the requested QoS level can be achieved (e.g., as RAB support is not available). In some embodiments, the service controller time slots traffic from the device end in synchronization with a BTS clock or absolute clock to facilitate the requested QoS level and to achieve necessary network capacity to support/facilitate the requested QoS level (e.g., minimizing jitter/inter-packet delay variation) based on current/forecasted network capacity on the link. At 1114, the service controller responds to the QoS request (e.g., grants or denies the QoS request). In some embodiments, another UI event is generated if the QoS request is denied as similarly described herein. At 1116 (assuming the QoS request is granted), the device initiates the QoS session. At 1118, the device service processor and/or the device service processor in secure communication with the service controller monitors and verifies the QoS session using various monitoring and verification techniques described herein (e.g., checks CDRs to determine if the QoS channel is properly implemented by the device). In some embodiments, a UI event is generated to notify the device user if there are potential problems with the QoS session implementation, to periodically inform the user of QoS charging, and/or other events/information related to QoS activities. At 1120, the process is completed. --

Please replace paragraph **[00147]** with the following rewritten paragraph:

[00147] -- Figure 12 illustrates a device stack for providing various service usage measurement techniques in accordance with some embodiments. Figure 12 illustrates a device stack providing various service usage measurement from various points in the networking stack for a service

monitor agent (e.g., for monitoring QoS related activities as described herein), a billing agent, and an access control integrity agent to assist in verifying the service usage measures, QoS related activities and functions, 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 driver/agent 1690 (e.g., policy enforcement point driver/agent), 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. --

Please replace paragraph **[00150]** with the following rewritten paragraph:

[00150] -- 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 and described herein. 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 (e.g., QoS 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 QoS 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. --

Please replace paragraph **[00153]** with the following rewritten paragraph:

[00153] -- Figure 13 illustrates another device stack for providing various service usage measurement techniques in accordance with some embodiments. 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. --

REMARKS

The specification has been amended to correct various typographical, grammatical, and formatting errors. No new matter has been added.

Reconsideration of the application and allowance of all claims are respectfully requested based on the preceding remarks. If at any time the Examiner believes that an interview would be helpful, please contact the undersigned.

Respectfully submitted,

Dated: August 4, 2010

/Michael J. Schallop/
Michael J. Schallop
Registration No. 44,319
V 408-973-4762
F 408-973-2595

VAN PELT, YI & JAMES LLP
10050 N. Foothill Blvd., Suite 200
Cupertino, CA 95014

Electronic Acknowledgement Receipt	
EFS ID:	8157696
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	21912
Filer:	Michael J. Schallop/Veronica Pula
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Application Type:	Utility under 35 USC 111(a)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		RALEP029_Preliminary_AMD_A.pdf	194460 5485a37447be00f9ccdaa2e2d2260b1a0d119f08	yes	45

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	Preliminary Amendment	1	1
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	Specification	3	44
	Applicant Arguments/Remarks Made in an Amendment	45	45
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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

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	08/04/2010	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 50	Minus	** 50	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 4	Minus	***4	= 0	X $ =		OR	X $220=	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	0

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	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:
/Trina Steptoe/

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.**

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

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	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/695,021	01/27/2010	2617	3000	RALEP029	50	4

CONFIRMATION NO. 7079

21912
VAN PELT, YI & JAMES LLP
10050 N. FOOTHILL BLVD #200
CUPERTINO, CA 95014

UPDATED FILING RECEIPT

OC000000041269391

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 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 61/252,151 10/15/2009
and claims benefit of 61/252,153 10/15/2009

Foreign Applications

If Required, Foreign Filing License Granted: 02/12/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/695,021**

Projected Publication Date: 08/05/2010

Non-Publication Request: No

Early Publication Request: No

Title

QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES

Preliminary Class

370

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

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Gregory G. Raleigh	Examiner:	Not Assigned
Application No.:	12/695,021	Art Unit:	2617
Filed:	January 27, 2010	Docket No.:	RALEP029
Title:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES		

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	50	Less 20	30		x $26 = $		OR	x $52 = $	1560
Independent	4	Less 3	1		x $110 = $		OR	x $220 = $	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 $	**3000.00**

☐ 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. RALEP029).

☒ 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. RALEP029).

☒ 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. RALEP029

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: **QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES**, the specification of which,

(check one)

1. ☐ is attached hereto.

2. ☒ was filed on January 27, 2010 as U.S. Application No. 12/695,021 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)

61/206,354 (Application No.)	1/28/2009 (Filing Date)
61/206,944 (Application No.)	2/4/2009 (Filing Date)

61/207,393 (Application No.)	2/10/2009 (Filing Date)
61/207,739 (Application No.)	2/13/2009 (Filing Date)
61/252,151 (Application No.)	10/15/2009 (Filing Date)
61/252,153 (Application No.)	10/15/2009 (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)

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:	12695021
Filing Date:	27-Jan-2010
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	Michael J. Schallop/Veronica Pula
Attorney Docket Number:	RALEP029
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:				
Claims in excess of 20	1202	30	52	1560
Independent claims in excess of 3	1201	1	220	220
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Late filing fee for oath or declaration	1051	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**3000**

Electronic Acknowledgement Receipt	
EFS ID:	7429739
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029
Receipt Date:	16-APR-2010
Filing Date:	27-JAN-2010
Time Stamp:	16:59:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$3000
RAM confirmation Number	3456
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	RALEP029_Response_to_Missing_Parts.pdf	83553 93aeac3d8ee899ac1054ee06648e5a1c83ef4fc1	no	2
Warnings:					
Information:					
2	Oath or Declaration filed	RALEP029_Declaration_POA.pdf	459159 cb372a813f29a36444b0184ac8ace02cce646622	no	2
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	39705 c9b35068074c64f6190ea6b9141073b24df3c630	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	582417		

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
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12/695,021	01/27/2010	2617	0.00	RALEP029	50	4

CONFIRMATION NO. 7079

21912
VAN PELT, YI & JAMES LLP
10050 N. FOOTHILL BLVD #200
CUPERTINO, CA 95014

FILING RECEIPT

OC000000040081253

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

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and claims benefit of 61/206,354 01/28/2009
and claims benefit of 61/206,944 02/04/2009
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and claims benefit of 61/252,151 10/15/2009
and claims benefit of 61/252,153 10/15/2009

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Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Title

QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES

Preliminary Class

370

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/695,021	01/27/2010	Gregory G. Raleigh	RALEP029

CONFIRMATION NO. 7079

21912
VAN PELT, YI & JAMES LLP
10050 N. FOOTHILL BLVD #200
CUPERTINO, CA 95014

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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:

- Additional claim fees of $**1780** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- 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 $**3000** 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.
- Total additional claim fee(s) for this application is $**1780**
  - $**220** for **1** independent claims over 3.
  - $**1560** for **30** total claims over 20.

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Attorney Docket No. RALEP029

APPLICATION FOR UNITED STATES PATENT

QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES

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

QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES

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. 61/252,151 (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.

[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.

BACKGROUND OF THE INVENTION

[0003] With the advent of mass market digital communications, applications 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), DOCSIS, DSL, and Wi-Fi (Wireless Fidelity) becoming user capacity constrained. In the wireless case, although network capacity will increase with new higher capacity wireless radio access technologies, such as MIMO (Multiple-Input Multiple-Output), and with more frequency spectrum and cell splitting 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 compared to wireless, wire line user service consumption habits are trending toward very high bandwidth applications and content 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 of the invention are disclosed in the following detailed description and the accompanying drawings.

[0006] **Figure 1** illustrates a functional diagram of a network architecture for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments.

[0007] **Figure 2** illustrates another functional diagram of another network architecture for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments.

[0008] **Figure 3** illustrates a functional diagram of another network architecture for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments.

[0009] **Figures 4A through 4C** illustrates a functional diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments.

[0010] **Figure 5** illustrates a functional diagram for generating a QoS activity map for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments.

[0011] **Figure 6** illustrates a functional diagram for quality of service (QoS) for device assisted services for an end to end coordinated QoS service channel control in accordance with some embodiments.

[0012] **Figure 7** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments.

[0013] **Figures 8A through 8C** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments.

[0014] **Figure 9** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments.

[0015] **Figure 10** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments.

[0016] **Figure 11** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments.

[0017] **Figure 12** illustrates a device stack providing various service usage measurement in accordance with some embodiments.

[0018] **Figure 13** illustrates a device stack providing various service usage measurement in accordance with some embodiments.

DETAILED DESCRIPTION

[0019] 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.

[0020] 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.

[0021] As wireless networks, such as mobile networks, evolve towards higher bandwidth services, which can include or require, for example, various levels of Quality of Service (QoS) (e.g., conversational, interactive data, streaming data, and/or various (end-to-end) real-time services that may benefit from QoS), demands will increase for converged network services to facilitate such services for end-to-end services between networks (e.g., to allow for control and/or support for such services, for example, QoS support, across network boundaries, such as

between wireless networks (such as various service provider networks) and IP networks (such as the Internet), and/or other networks). While various efforts have attempted to address such QoS needs, such as policy management frameworks for facilitating QoS end-to end solutions, there exists a need to facilitate various QoS requirements using device assisted services.

[0022] Accordingly, Quality of Service (QoS) for Device Assisted Services (DAS) are provided. In some embodiments, QoS for DAS is provided.

[0023] To establish a QoS channel, differentiated services are typically available, in which one class/level of service has a higher priority than another to provide for differentiated services on a network, such as a wireless network. For example, in a wireless network, various network elements/functions can be provisioned and controlled to establish a single end or end to end QoS channel. In some embodiments, a centralized QoS policy coordination and decision function using Device Assisted Services (DAS) techniques to assist in coordinating the QoS channel setup and control among the various elements of a wireless network is provided.

[0024] In some embodiments, QoS channel refers to the logical communication channel connected to a device that provides a desired level of QoS service level. For example, the QoS channel can be created with one or more QoS links, in which each link represents a QoS enabled connection that spans a portion of the total end to end network communication path from a near end device to a far end device. For example, the far end device can be on the same network or on a different network, potentially with different access technology and/or a different access network carrier. In some embodiments, the QoS channel includes one or more QoS links in which each link in the channel is QoS enabled, or one or more of the links in the channel is QoS enabled and others are not. As an example, a QoS channel can include the following links: a first device traffic path link, a first device to access network equipment element link (e.g. 2G/3G/4G wireless base station, WiFi access point, cable network head end, DSLAM, fiber aggregation node, satellite aggregation node, or other network access point/node), a first carrier core network, a long haul IPX network, a second carrier core network, a second device to access network equipment element link, and a second device traffic path link as similarly described herein with respect to various embodiments.

[0025] In some embodiments, each of the links described above have the ability to provide QoS services for that segment of an overall QoS channel. In some embodiments, the device traffic path link and/or the device to access network equipment element link are QoS enabled, but the carrier core network and/or IPX network links are not QoS enabled. In some embodiments, the core network and/or IPX network have sufficient over-provisioning of bandwidth that QoS is not limited by these network elements and, for example, can be limited by the device traffic link and/or the device to access network equipment element link do not have sufficient excess bandwidth making it desirable to QoS enable these QoS channel links. A common example is a 2G/3G/4G wireless network in which a device traffic path link and the device to access network element link (e.g., Radio Access Bearer (RAB)) are QoS enabled while the carrier core network and IPX network links are not (e.g., are provided at a best effort service level or other service levels).

[0026] In some embodiments, a QoS session refers to the QoS enabled traffic for a given device that flows over a QoS channel or QoS link. This QoS traffic supports a QoS service activity. In some embodiments, a QoS service activity includes a device service usage that is requested, configured, or preferably serviced with a given level of QoS. In some embodiments, a device QoS activity is a combination of one or more of the following: application, destination, source, URL or other similar service identifier, service provider, network type, traffic type, content type, network protocol, session type, QoS identifier, time of day, network capacity (e.g., network busy state), user service plan authorization or standing, roaming/home network status, and/or other criteria/measures as similarly described herein. For example, QoS service activities that are supported by QoS sessions can include VOIP traffic, streaming video traffic, differentiated access bandwidth during busy network periods, real-time interactive traffic, such as network connected multimedia meetings (e.g., shared presentations, picture, video, voice, and/or other such applications/services), best effort interactive such as Internet browsing, time sensitive services, such as email message body delivery, near real time interactive services, such as SMS or push to talk, background download services, such as email downloads and other file transfers (e.g., FTP), and/or truly background download services, such as software updates.

[0027] In some embodiments, various QoS levels or classes are supported. For example a conversation class can provide for real-time traffic, which is typically very delay sensitive but

can tolerate bit errors and packet losses. The conversational class is typically used for Voice Over IP (VOIP) and video telephony, in which users of such services benefit from the short delay features of the conversational class) A streaming class is similar to the conversational class except that the streaming class is typically can tolerate more delay than the conversational class. The streaming class is generally used for one end of the connection is a user (e.g., human user) and the other end is a machine/computer (e.g., for streaming content applications, such as streaming of video, such as movies or other video content). An interactive class is generally intended for traffic that allows delay variation while requiring reasonably low response time (e.g., web browsing or other applications in which the channel can be unused for long periods of time but when a user makes a request for a new page/data, the response time should be reasonably low). A background class is generally used for lowest priority service usages (e.g., typically used for e-mail, software updates, and/or other similar applications). In some embodiments, various QoS classes or services are applicable to the conversational class. In some embodiments, various QoS classes or services are also applicable to the streaming class. In some embodiments, various QoS classes or services are also applicable to the interactive class but typically not applicable to the background class. As will now be apparent to one of ordinary skill in the art, various other classes can be provided with lower or higher granularity based on service usage/channel requirements and/or network architectures.

[0028] In some embodiments, a QoS link or a QoS channel supports one QoS session. In some embodiments, a QoS link or a QoS channel supports multiple QoS sessions. In some embodiments, QoS link provisioning is provided to setup the QoS traffic level for a given QoS session or group of QoS sessions.

[0029] In some embodiments, a QoS channel is a single ended QoS channel or an end to end QoS channel. For example, if a QoS channel is end to end, then the QoS channel provisioning is accomplished in a coordinated manner for each QoS enabled link in the QoS channel. If a QoS channel is single ended, then the network elements and/or device participate in provisioning as much of one end of the QoS channel as possible, leaving provisioning of the QoS for the other end of the channel as the responsibility of the device and/or network elements that handle the traffic at the other end of the QoS channel. In some embodiments a single ended QoS channel includes another single ended QoS channel at the other end. In some embodiments, only

one end has single ended QoS channel enablement while the other end of the channel is a best effort service level, which, for example, can be used where one end of the QoS channel has tighter constraints on traffic capacity or quality than the other end (e.g., a VOIP call with one end that is QoS enabled on a 3G wireless network that has relatively tight bandwidth compared to a lightly loaded cable modem network device on the other end which may not need to be QoS enabled in order to achieve adequate voice quality).

[0030] In some embodiments, a QoS request (e.g., a QoS channel request or QoS service request) is a request for a QoS provisioning event to enable a QoS channel for one or more QoS service activities. In some embodiments, QoS availability assessment includes determining whether one or more of the links in a possible QoS channel are available (e.g., based on network capacity and transmission quality) to provision the necessary level of QoS for a requested QoS channel. In some embodiments, a QoS request is initiated by a device, a user, an application, and/or a network element/function as similarly described herein.

[0031] In some embodiments, a service plan refers to the collection of access service capabilities and/or QoS capabilities that are associated with a communications device. In some embodiments, the access and/or QoS capabilities are determined by the collection of access service control policies for the device. In some embodiments, these service control policies are implemented in the network equipment. In some embodiments, these access service control policies are implemented both in the device and in the network equipment. In some embodiments, these access service control policies are implemented in the device. In some embodiments, there are different levels of service control capabilities (policies) based on different levels of service plan payments or device standing or user standing. In some embodiments, there are different levels of service control policies based on network type, time of day, network busy status, and/or other criteria/measures as similarly described herein with respect to various embodiments. In some embodiments, the access control and QoS control policies are based on the type of service activity being sought. In some embodiments, the QoS level and access level available for a given service activity for a given device or user is determined by the policies associated with the service plan. In some embodiments, a QoS authorization assessment is performed to determine whether a device or user has sufficient service plan standing to allow the requested level of QoS.

[0032] In some embodiments, before a QoS channel or link is provisioned (or before a QoS request is responded to or filled), a QoS availability assessment is performed to determine whether sufficient communication channel resources are available to provision the necessary level of QoS for the QoS channel or link. In some embodiments, this QoS availability assessment is determined by assessing the available QoS capacity for one or more necessary QoS links in the channel. For example, the available QoS link capacity can be assessed for one or more of a device traffic path, a device to access network equipment element link, a core network link, and/or an IPX network link. If the QoS assessment shows that the necessary channel capacity and quality is available for the desired QoS level for one or more desired QoS service activities, then a QoS channel request or QoS service request can be granted. In some embodiments, a QoS link or QoS channel reservation process is provided to reserve QoS capacity and quality in advance of link or channel provisioning to ensure that the available QoS resources are not assigned between the time of QoS availability assessment and QoS channel provisioning.

[0033] In some embodiments, the QoS availability assessment is performed after QoS authorization assessment. This prevents the unnecessary exercising of network elements when the device or user does not have sufficient service plan standing to receive the desired level of QoS even if it is available. This can be an important screening function performed on the device in the service processor, or by a centralized network function such as the service controller (or interchangeably the home agent, HLR, AAA, base station, one of the gateways or other network element/function). In some embodiments, QoS availability is assessed without conducting a QoS authorization assessment or before receiving the response to a QoS authorization assessment.

[0034] In some embodiments, a QoS channel is provisioned to create the QoS channel to support a QoS session (e.g., a QoS service activity). In some embodiments, QoS channel provision includes assigning, routing, and/or otherwise causing the QoS session traffic to flow over one or more QoS links in the assigned QoS channel.

[0035] In some embodiments, device assisted service traffic control and QoS apply readily and directly to the problems of managing a QoS device link for QoS channel provisioning. Accordingly, in some embodiments, a service provider is provided to assist in

provisioning the device portion of the QoS channel. In some embodiments, the service processor provisions the device link portion of the QoS channel by placing a higher priority on higher QoS level traffic. In some embodiments, this QoS priority is implemented in a number of ways, including routing the higher priority QoS traffic into first priority in the downstream and/or upstream traffic queues. Upstream traffic queuing is performed directly in some embodiments by transmitting guaranteed bit rate traffic first at higher available throttling rates, differentiated QoS traffic second with a controlled throttling rate, best effort traffic third with possibly lower controlled throttled rates, and/or background traffic fourth when/if bandwidth not needed by the higher levels of QoS traffic and at lower controlled throttling rates. For example, downstream traffic can be handled by queuing traffic and delaying or preventing TCP acknowledgements to be returned for the lower levels of QoS priority, while immediately passing the traffic and TCP acknowledgements for higher levels of QoS priority. The device link portion of the QoS channel is thus provisioned by assigning policies for the queuing priority, delay, throttle rate and TCP acknowledgement return rate for device traffic in accordance with the bandwidth that is available at any point in time for the device. In some embodiments, various device service processor traffic control capabilities regulate or partially regulate QoS in accordance with a set of network policy instructions, including, in some embodiments, a service plan policy set.

[0036] In some embodiments the device service processor establishes multiple QoS channels through the device traffic path with each QoS channel having traffic control policies as described herein, with each QoS channel policy set creating a different class of QoS. In some embodiments, employing this multiple QoS channel approach, QoS for a given service activity is provided by routing the traffic for that QoS activity to the appropriate QoS channel with the appropriate QoS policy settings. The routing to the appropriate QoS channel can be provided using various techniques. For example, the routing can be provided by applying a common service traffic control policy set to traffic associated with all QoS service activities that require or request the QoS provided by the common service traffic control policy set. The application of the service traffic control policy set can be accomplished in a number of ways utilizing the embodiments described for the policy implementation agent and the policy control agent described herein. In such embodiments, the problem of assigning a QoS channel to a number of QoS service activities is reduced to applying a pre-determined set of service traffic control policies to each of the QoS service activities, with each pre-determined set of service traffic

control policies representing a different QoS class. The device can then manage the overall QoS for all traffic based on the available traffic capacity and quality, the total aggregate traffic demand for each QoS traffic class and the policy rules that determine how each traffic class is provided with differential bit rate and traffic quality as compared to the other traffic classes for a given level of available traffic capacity and quality.

[0037] Based on the aggregate demand for each traffic QoS class, and the traffic capacity and quality level available to the device, the service processor can adjust the total available bit rate or percentage of available traffic capacity for each QoS class. For example, in some embodiments, the aggregate demand for the real time interactive traffic control class (e.g. services, such as VOIP, emergency communication services or high performance real time competitive gaming) can be determined, and the QoS routing function on the device (e.g., a QoS router agent/function) can first allocate enough constant bit rate traffic capacity from the available traffic capacity to satisfy these services, with each QoS service activity that requires this QoS class being assigned to this QoS channel. As more QoS service activities require this traffic class, the capacity allocated to the QoS channel out of the available device capacity is increased, and when fewer QoS service activities require this traffic class the capacity for this QoS channel is released. In the event that the device does not have any more available capacity with a guaranteed bit rate QoS level, then additional QoS service activities that desire, require or request this QoS level will not be provided this QoS level, and instead will either be provided with a lower QoS level or will not be allowed to connect to the access network. In some embodiments, there can be a hierarchy among the possible QoS service activities so that if there is no more capacity available at a given service QoS level, then the available capacity for that QoS class is provided to the service activities requiring that QoS from highest priority to lowest, until the available QoS class capacity is consumed, and then one or more QoS service activities that are too low on the priority list to obtain service with that QoS class are either bumped to a lower QoS class or are denied access. In some embodiments, once the required capacity to satisfy the real time constant rate traffic needs is satisfied, the remaining capacity available to the device is then divided among the other QoS channel classes in accordance with a priority policy, with the priority policy being based on the relative priority of each service class, the relative priority of each QoS service activity, or a combination of the relative priority of each QoS service class and each QoS service activity. For example, these relative priority policies can

vary from device to device based on service plan selection, device type, user standing, user group, device location, device network connection, type of network, time of day, network busy state, and/or other criteria/measure.

[0038] In some embodiments, a QoS link is established between the device and an access network equipment element. For example, such equipment element embodiments can include a 2G/3G/4G wireless base station, a wireless access point, a cable network head end, a DSL network DSLAM, a fiber network device traffic aggregator, a satellite network device traffic aggregator, a frame relay aggregation node, an ATM aggregation node, and/or other network equipment. In some embodiments, a logical communication channel is created between the device and the network equipment element, with the logical communication channel supporting a given level of QoS or QoS class traffic policy set. For example, the logical channel can include a RAB formed between a 2G/3G/4G base station and a wireless end point device. The RAB can be formed by controlling the media access control (MAC) parameters of the base station radio channel so that a given level of QoS class policies can be implemented. For example, the RAB can support constant bit rate, low latency communication traffic for guaranteed bit rate real time traffic, or a differentiated high priority access channel for streaming traffic, or a best effort random access channel for best effort traffic, or an available unused capacity traffic for background traffic. The QoS channel link created in this manner can be dedicated to a single device, or shared with a subset of devices, or available to all devices. The QoS channel link created in this manner can be used by the device to support a single QoS activity as described herein, or a group of QoS activities as described herein. It will now be apparent to one of ordinary skill in the art that similar settings for cable head end and cable modem MAC can yield similar QoS classes for QoS links for the cable modem case and that similar techniques can be applied for a wireless access point or a satellite system MAC to achieve similar QoS classes for QoS links. It will also now be apparent to one of ordinary skill in the art that by creating multiple logical channels in the device link, and/or adjusting the available access network capacity and quality for each logical device communication channel in the DSLAM or fiber aggregator, similar QoS class QoS links can be established for the DSL and fiber distribution network cases.

[0039] In some embodiments the device service processor serves to route QoS service activities to the appropriate logical communication channel established for the desired QoS class supported by a QoS link between the device and the access network equipment element. In some embodiments, the device service processor elements (e.g., the policy implementation agent and/or the policy control agent) can be used in some embodiments to assign the same QoS traffic control policies to one or more QoS service activities that require the same QoS level. In a similar manner, in some embodiments, the device service processor elements can be used to assign or route service activity traffic for a given QoS class to the correct logical communication channel between the device and the access network element (e.g., a 2G/3G/4G base station) that supports the traffic control policies for the desired QoS class. For example, a QoS service link that supports guaranteed bit rate and latency can be established with one or more RABs from a base station to the device, and a second QoS service link can be established that supports differentiated preferred access for streaming content using one or more differentiated access RABs, and a third best effort RAB can be used to support best effort traffic. Each of the required RABs is first requested and then provisioned as described herein based on the aggregate required capacity and quality for one or more QoS service activities that require or desire the specific QoS service class associated with the RAB logical channel policy parameters. Once the set of logical QoS channels is thus established, the service processor (e.g., QoS router agent/function) routes the traffic associated with each QoS service activity to the appropriate RAB. In some embodiments, the service processor can detect increases or decreases in aggregate QoS class demand for each QoS class as QoS activities are initiated or terminated for that QoS class, and the service processor can communicate the required increases or decreases in the RAB assignments required to support that logical QoS channel.

[0040] In some embodiments, the access QoS link is established by direct communication from the device in which the device requests the QoS channel or link from the access network equipment element, or the device requests the QoS channel or link from an intermediate networking device, such as a service controller (e.g., or a readily substituted device with similar features, such as a home agent, an HLR, a mobile switching center, a base station, an access gateway, a AAA system, or a billing system). In some embodiments, the device service processor bases the QoS channel or link request on an association the device performs to match a QoS service activity with a desired or required QoS class or QoS traffic control policy

set. For example, this association of QoS class or QoS traffic control policy set with QoS service activity can be determined by a predefined policy mapping that is stored on the device and used by the service processor. In some embodiments, this policy mapping store is populated and/or updated by a service controller (e.g., or similar function as described herein). In some embodiments, the mapping is determined by a service controller (e.g., or similar function as described herein) based on a report from the device of the QoS service activity that needs the QoS channel or link.

[0041] In some embodiments, the required or desired QoS level for one or more QoS service activities is determined by a set of QoS service traffic control policies that are pre-assigned to various QoS service activities. For example, a given application can be pre-assigned a QoS class. As another example, a web service destination such as a VOIP service site can be assigned a QoS class. As another example, a given application can have one QoS assignment level for general Internet traffic but have a QoS assignment for real-time gaming traffic. As another example, a real-time broadcasting website can have a best effort QoS level assigned to programming information and general browsing and have a differentiated streaming QoS level for broadcast traffic content. In some embodiments, detection of QoS need or QoS assignment request for a given activity can be assigned by a device service processor according to a pre-defined QoS policy rules table (e.g., QoS activity table), or can be determined by a service controller based on information reported by the device, or can be requested by an application through a QoS application interface (e.g., QoS API), or can be determined by the nature of incoming traffic.

[0042] In embodiments, in which both end points in the QoS channel participate in establishing an end to end QoS channel, the required QoS level is determined and/or communicated by the originating end point. In some embodiments, the required QoS level is determined and/or communicated by the receiving end point. In some embodiments the QoS level is determined and/or communicated by the originating end point service controller (e.g., or the access network element (such as a base station), the HLR, home agent, mobile switching center, AAA, gateway, or other network element/function). In some embodiments, the QoS level is determined and/or communicated by the receiving end point service controller (e.g., or alternatively the access network element (such as a base station), the HLR, home agent, mobile

switching center, AAA, gateway, or other network element/function). In some embodiments, the receiving end point service controller (e.g., or the access network element (such as a base station), the HLR, home agent, mobile switching center, AAA, gateway or other network function) and the originating end point service controller (e.g., or other similar function) communicate with one another to coordinate establishment of the QoS channel between the end points.

[0043] In some embodiments, the near end or originating end device service processor contacts the far end or terminating device service processor to initiate a QoS channel. In some embodiments, the initiation of the QoS channel from the near end or originating device is performed automatically by the far end device when its service processor detects that a given level of QoS is needed for the communication between the two devices. In some embodiments, the near end or originating device service processor detects the need for a QoS channel to the far end or terminating device and contacts a central network resources, such as the service controller (e.g., or other equipment element with similar function for this purpose), and the service controller provisions the far end of the QoS channel, either by communicating directly with the far end device or by communicating with the far end device's service controller (e.g., or other equipment element with similar function for this purpose). In some embodiments, in which the far end device service controller is contacted to assist in provisioning the QoS channel, there is a look up function to determine the address of the far end service controller based on a look up index formed from some aspect of the far end device credentials (e.g.., phone number, SIM I.D., MEID, IMSI, IP address, user name, and/or other device credentials).

[0044] In some embodiments, the mapping of QoS service activity to the desired level of QoS class or QoS traffic control policies is determined by providing a QoS API in the device service processor that applications use to request a QoS class or QoS channel connection. In some embodiments, an API is provided so that application developers can create application software that uses the standard interface commands to request and set up QoS channels. In some embodiments, the API does one or more of the following: accepts QoS requests from an application, formats the QoS channel request into a protocol appropriate for transmission to network equipment responsible for assessing QoS channel availability (e.g., including possibly the device traffic control system), coordinates with other network elements (e.g., including

possibly the device traffic control system) to reserve a QoS channel, coordinates with other network elements (e.g., including possibly the device traffic control system) to provision a QoS channel, informs the application that the desired QoS channel can be created or not, and/or coordinates with other network elements (e.g., including possibly the device traffic control system) to connect the application with the desired QoS channel class. In some embodiments, the QoS API accepts the application QoS request and communicates and possibly coordinates with one or more QoS network equipment elements, such as a base station, cable head end or access point. In some embodiments, the QoS API accepts the QoS request from the application and communicate and possibly coordinates with an intermediate network element, such as a service processor (e.g., or other similar function as described herein). In some embodiments the QoS API assesses the QoS service plan standing for the device or user before sending QoS channel requests to other network elements, and only initiates the QoS request sequence if required service plan authorization is in place. In this manner, the potentially complex process of establishing a QoS channel with all the specific equipment communication protocols that typically need to be supported to assess QoS channel availability and provision the QoS channel are simplified into a limited set of API commands that are easy for an application development community to learn about and use for QoS differentiated services and applications.

[0045] In some embodiments, local traffic control on the device service processor is combined with traffic control in the link between the device and the access network equipment element. In this manner, both the device traffic control path QoS link and the device to access network element QoS link can be coordinated for best device QoS performance results given the available capacity and quality of the access network traffic for the device. In some embodiments the policies for how the device manages local traffic control, establishes access network element logical channels (e.g., RABs) and routes traffic to and from the access network element logical channels is all determined by pre-defined policy rules loaded onto the device by the service controller (or other equivalent network element). In some embodiments, these policies are determined in the service controller itself.

[0046] In some embodiments, a QoS user interface (e.g., QoS UI) is presented to the device user. In some embodiments, the QoS UI notifies the user what level of QoS services the device is authorized to receive based on the service plan selection. In some embodiments, the

QoS UI notifies the user what level of QoS services are available on the present network the device is connected to at the present time. In some embodiments, the QoS UI notifies the user when a level of QoS service that is higher than that authorized by the user service plan is required or desirable for a given service activity that the device has initiated. In some embodiments, the QoS UI provides the user with a set of one or more upgrade options to upgrade the service plan to include a higher level of QoS for one or more service activities. In some embodiments, the QoS UI provides the user with an opportunity to specify what level of QoS the user would like to employ for one or more service usage activities. In some embodiments, the QoS UI allows the user to specify a service plan setting that provides differentiated QoS during times when the network is busy. In some embodiments, the QoS UI allows the user to purchase one or more grades of service QoS with either a post-pay for a pre-defined service period and one or more pre-defined service usage limits by QoS class, a pre-pay for one or more pre-defined service usage limits by QoS class, or another payment system for differentiated QoS services. In some embodiments the QoS UI provides the user with an opportunity to QoS enable or pay for QoS services for a connection that is initiated by an incoming connection to the device.

[0047] In some embodiments, QoS for DAS techniques include verifying that the device is properly implementing the QoS traffic control policies, for example, in accordance with a service plan. This ensures that errors, hacking, user device software settings manipulations, or other malware events do not result in inappropriate levels of QoS for a given device or group of devices. Accordingly, in some embodiments, the traffic control and QoS verification techniques described herein are employed to verify that the proper level of QoS is applied for a given service usage activity in accordance with a QoS priority policy. For example, verification of QoS channel request policy rules behavior can be implemented in a variety of ways including, as an example, monitoring device QoS channel requests and comparing the level of QoS requested with the level of QoS the device is authorized to receive in the service plan in effect for the device. Verification of proper QoS channel usage behavior by a device can be implemented in a variety of ways including, for example, monitoring network based reports of QoS service usage and comparing the network based reports against the service policy rules that should be in effect given the device service plan. Verification of proper device traffic control to implement a QoS service policy that is in effect can be accomplished in a variety of ways by verifying that the appropriate traffic control policy rules are being properly implemented as described herein.

[0048] In some embodiments, the QoS router prioritizes traffic on the device. In some embodiments, the QoS router connects the QoS enabled session to the RAB that has the proper QoS level. In some embodiments, one session is routed to the RAB. In some embodiments, more than one session can be routed to an RAB. In some embodiments, multiple RABs providing multiple QoS levels are created to the device, and the QoS router routes each service activity to the RAB dictated by the QoS policy rules in effect on the device.

[0049] In some embodiments, the network collects service usage charges for different QoS classes. In some embodiments, there is differentiated service charging for the different classes of QoS service usage. As an example, since guaranteed bit rate traffic consumes network resources whether the traffic capacity is used or not, there can be a time element involved in the charging calculations. As a more detailed example, guaranteed bit rate services can be charged by the total bandwidth provisioned to the device at a given time multiplied by the amount of time that that bandwidth is made available. In some embodiments, differentiated access traffic that has higher QoS than best effort traffic but is not guaranteed bit rate can be charged at a higher rate than best effort traffic but lower than guaranteed bit rate. Such traffic in some embodiments can be charged based on the time the QoS channel is made available and the total amount of data transmitted over the channel, or can only be based on the total amount of data transmitted over the channel. Best effort traffic is charged in some embodiments based only on the total amount of data used, with the data charges being less than differentiated streaming access services. Background data services in some embodiments are charged at the lowest rate, possibly with only certain times of the day or periods of low network traffic demand being available for such services, and with the service being based on total data transmitted. In some embodiments, all QoS service levels can be charged based on a fixed price for a fixed charging period, possibly with a service usage cap with additional charges if the service cap is exceeded. In such fixed price scenario embodiments, the price charged is again higher for higher levels of QoS.

[0050] In some embodiments, the network equipment (e.g., access network element, gateways, AAA, service usage storage systems, home agent, HLR, mobile data center, and/or billing systems) record and report service usage for one or more of the QoS service classes used by the device. In some embodiments, the device service processor records and reports service usage for one or more of the QoS service classes used by the device and reports the QoS service

class usage to the service controller (e.g., or other substitute network element). In some embodiments, in which the device is recording reporting usage for one or more QoS service classes, it is important to verify the device service usage reports to ensure that the device usage reports are not distorted, tampered with, and/or otherwise in error. In some embodiments, verifying service usage reports against service usage that should be occurring given the service control policies in place on the device, service processor agent functional operation verification, test service usage events, agent query response sequences, device service processor software protection techniques, device service processor software environment checks, and several other techniques are provides as described herein. For example, using one or more of these verification techniques can provide a verifiable device assisted QoS service usage charging system.

[0051] In some embodiments, device assisted traffic control is provided for managing network congestion as follows. When a given base station or group of base stations experience traffic demand that is high relative to the available capacity and/or service quality that can be provided, and such a condition is detected by means of network busy state assessment as described below, then a service controller (e.g., or other interchangeable network function) can issue traffic control throttling policies to the devices in accordance with a measure of the excess traffic demand the one or more base stations is experiencing. For example, the device service processors connected to an overly busy base station can be instructed to reduce the traffic control priority for one or more classes of QoS traffic, reducing the queuing priority, throttling rate, delay and/or access allowance for some or all of one or more classes of traffic. As another example, background download processes, such as software updates can be turned off completely or throttled back significantly. As another example, best effort traffic such as Internet browsing can be throttled or reduced for a group of devices connected to base stations experiencing excess traffic demand. As another example, a policy can be implemented on the devices connected to busy base stations in which the device is allowed to browse or conduct other best effort service activities at a relatively high throttling rate for a period of time, but if the device uses more than a certain amount of service (e.g., total data downloaded and/or uploaded) in a certain period of time then the device may be traffic controlled according to an adaptive throttling policy as described in previous disclosures. In some embodiments, higher QoS level traffic cannot be throttled in such circumstances, such as VOIP traffic where real time

guaranteed bit rate is important to meet user service needs or expectations, while lower priority traffic such as interactive browsing and/or background download are throttled and/or blocked. In some embodiments, the QoS availability assessment processes described herein are adjusted so that higher QoS channels are not provided and provisioned in times or locations in which a given base station or group of base stations experience excess demand or demand above a given threshold.

[0052] In some embodiments, users or devices that have service plans with higher QoS levels, or service plans with higher priority during busy network periods have different traffic control policies applied to them that result in a higher level of traffic performance and/or a higher level of QoS service availability. For example, emergency service workers can be given higher traffic control access policies that result in differentiated services during peak busy times on the network or a portion of the network. In some embodiments, users can obtain a premium service plan for differentiated access during peak busy time periods or may use higher levels of QoS service settings and/or service plans to achieve differentiated service during peak busy periods. As another example, services that demand high QoS, such as real time voice services, instant messaging, push to talk, differentiated video streaming, and/or interactive gaming, are not traffic controlled to the same extent that other lower priority services or lower class service plans are traffic controlled during peak busy times. For example, this type of service differentiation can also be applied based on device type, user group, user standing, user reward zone points, other criteria/measures as similarly described herein.

[0053] In some embodiments, the decision to reduce the access traffic control settings as described above is made by the device service processor based on the device's assessment of the network capacity, which can determined using various techniques as described herein. In some embodiments, the decision to reduce the access traffic control settings as described above is made by a service controller (e.g., or other interchangeable network equipment element or elements as described herein) connected to the device that provides instructions to the device to adjust the access policy settings. For example, the service controller can obtain the network capacity information from access equipment elements, from device reports of traffic capacity and/or quality as described herein, or from reports on traffic capacity and/or quality obtained from dedicated devices used for the purpose of assessing network capacity. In some

embodiments, the decision to reduce the access traffic control settings as described above is based on the time of day or day of week or both to accommodate cyclical patterns in network capacity and traffic demand.

[0054] In some embodiments, a service controller (e.g., or other interchangeable network equipment element or elements as described elsewhere) assesses network busy state and then controls device traffic demand by reducing the offered capacity for one or more service classes supported by the access network equipment elements such as a wireless base station. In such embodiments, the service controller (e.g., or similar function) gathers the network capacity information with one of the techniques described herein and instructs one or more of the access network equipment elements to reduce the offered capacity for one or more levels of service QoS, to one or more of the devices connected to the access network equipment elements. For example, the determination of which devices to throttle back can be made based on an equal throttling of all devices of a given service plan status, or based on the device traffic usage patterns in the recent past as described herein, or based on a combination of service plan status and recent traffic usage patterns.

[0055] In some embodiments, the device is enabled with ambient services that have differentiated QoS services as part of the ambient service offering. For example, this can be accomplished using the pre-assigned QoS policies for a given service activity set within the ambient service, or using an ambient service application that requests QoS through the QoS API. Other embodiments for providing QoS differentiated service activities within ambient service offerings will now be apparent to one of ordinary skill in the art.

[0056] In some embodiments, the QoS service control policy is adapted as a function of the type of network the device is connected to. For example, the QoS traffic control policies and/or the QoS service charging policies can be different when the device is connected to a wireless network (e.g., a 3G/4G network where there is in general less available QoS enabled traffic capacity) than when the device is connected to a wired network (e.g., a cable or DSL network where there is in general a higher level of QoS capacity available). In such embodiments, the device service processor and the service controller can coordinate to adapt the QoS service control policies and/or the QoS service charging policies to be different depending

on which network the device is connected to. Similarly, the device QoS service control policy and/or QoS service charging policy can also be adapted based on whether the device is connected to a home wireless network or a roaming wireless network.

[0057] In some embodiments, various of the QoS related techniques described herein are performed on the device using DAS techniques and/or on the service controller in secure communication with a verified service processor executed on the device using DAS techniques. In some embodiments, various of the QoS related techniques described herein are performed by/in coordination/communication with one or more intermediate network elements/functions for assisting in various QoS functions.

[0058] **Figure 1** illustrates a functional diagram of a network architecture for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS techniques described herein are implemented using the network architecture shown in Figure 1.

[0059] 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 (e.g., via a firewall 124), 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, one or more of the devices 100 are in communication with other network element/equipment that provides an access point, such as a cable network head end, a DSL network DSLAM, a fiber network aggregation node, and/or a satellite network aggregation node. In some embodiments, each of the wireless devices 100 includes a service processor 115 (as shown) (e.g., executed on a processor of the wireless device 100), and each service processor connects through a secure control plane link to a service controller 122 (e.g., using encrypted communications).

[0060] In some embodiments, service usage information includes network based service usage information (e.g., network based service usage measures or CDRs, which can, for example, be generated by service usage measurement apparatus in the network equipment), which is obtained from one or more network elements (e.g., BTS/BSCs 125, RAN Gateways (not

shown), Transport Gateways (not shown), Mobile Wireless Center/HLRs 132, AAA 121, Service Usage History/CDR Aggregation, Mediation, Feed 118, or other network equipment). In some embodiments, service usage information includes micro-CDRs. In some embodiments, micro-CDRs are used for CDR mediation or reconciliation that provides for service usage accounting on any device activity that is desired. In some embodiments, each device activity that is desired to be associated with a billing event is assigned a micro-CDR transaction code, and the service processor 115 is programmed to account for that activity associated with that transaction code. In some embodiments, the service processor 115 periodically reports (e.g., during each heartbeat or based on any other periodic, push, and/or pull communication technique(s)) micro-CDR usage measures to, for example, the service controller 122 or some other network element. In some embodiments, the service controller 122 reformats the heartbeat micro-CDR usage information into a valid CDR format (e.g., a CDR format that is used and can be processed by an SGSN or GGSN or other network elements/equipment used/authorized for generating or processing CDRs) and then transmits it to a network element/function for CDR mediation (e.g., CDR Storage, Aggregation, Mediation, Feed 118).

[0061] In some embodiments, CDR mediation is used to account for the micro-CDR service usage information by depositing it into an appropriate service usage account and deducting it from the user device bulk service usage account. For example, this technique provides for a flexible service usage billing solution that uses pre-existing solutions, infrastructures, and/or techniques for CDR mediation and billing. For example, the billing system (e.g., billing system 123 or billing interface 127) processes the mediated CDR feed from CDR mediation, applies the appropriate account billing codes to the aggregated micro-CDR information that was generated by the device, and then generates billing events in a manner that does not require changes to the existing billing systems (e.g., using new transaction codes to label the new device assisted billing capabilities). In some embodiments, network provisioning system 160 provisions various network elements/functions for authorization in the network, such as to authorize certain network elements/functions (e.g., CDR storage, aggregation, mediation, feed 118 or other network elements/functions) for providing micro-CDRs, reformatted micro-CDRs, and/or aggregated or reconciled CDRs.

[0062] As shown in Figure 1, a CDR storage, aggregation, mediation, feed 118 is provided. In some embodiments, the CDR storage, aggregation, mediation, feed 118 receives, stores, aggregates and mediates micro-CDRs received from mobile devices 100. In some embodiments, the CDR storage, aggregation, mediation, feed 118 also provides a settlement platform using the mediated micro-CDRs, as described herein. In some embodiments, another network element provides the settlement platform using aggregated and/or mediated micro-CDRs (e.g., central billing interface 127 and/or another network element/function).

[0063] In some embodiments, various techniques for partitioning of device groups are used for partitioning the mobile devices 100 (e.g., allocating a subset of mobile devices 100 for a distributor, an OEM, a MVNO, and/or another partner or entity). As shown in Figure 1, a MVNO core network 210 includes a MVNO 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). In some embodiments, the MVNO CDR storage, aggregation, mediation, feed 118 receives, stores, aggregates and mediates micro-CDRs received from mobile devices 100 (e.g., MVNO group partitioned devices).

[0064] Those of ordinary skill in the art will appreciate that various other network architectures can be used for providing device group partitions and a settlement platform, and Figure 1 is illustrative of just one such example network architecture for which device group partitions and settlement platform techniques described herein can be provided.

[0065] In some embodiments, 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 apparatus/systems 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 provides 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 and embodiments 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 in Figure 1, 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.

[0066] In some embodiments, a service processor download 170 is provided, which provides for periodical downloads/updates of service processors (e.g., service processor 115). In some embodiments, verification techniques include periodically updating, replacing, and/or updating an obfuscated version of the service processor, or performing any of these techniques in response to an indication of a potential compromise or tampering of any service processor functionality and/or QoS functionality executed on or implemented on the device 100.

[0067] 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/assisted service usage information (e.g., micro-CDRs) for one or more devices on the wireless network (e.g., devices 100); and provides the device generated service 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, as described herein, the CDR storage, aggregation, mediation, feed 118 collects/receives micro-CDRs for one or more devices on the wireless network (e.g., devices 100). 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 service usage information. In some embodiments, 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 (network based) CDRs and/or micro-CDRs for the one or more devices on the wireless network; applies a set of rules to the aggregated CDRs and/or micro-CDRs using a rules engine (e.g., bill by account, transactional billing, revenue sharing model, 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, a revenue sharing platform is provided using various techniques described herein.

[0068] 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 (e.g., aggregated and mediated CDRs and/or micro-CDRs that are then translated into standard CDRs for a given wireless network) for the one or more devices on the wireless network to a billing interface (e.g., central billing interface 127) or a billing system (e.g., central billing system 123). 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 (e.g., service controller 122) to collect the device generated service usage information (e.g., micro-CDRs) 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 service usage information 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 transport gateway and/or a Radio Access Network (RAN) gateway to collect the network generated/based service usage information for the one or more devices on the wireless network. In some embodiments, the service controller 122 communicates the device assisted service usage information (e.g., micro-CDRs) to the CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements).

[0069] 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 CDR storage, aggregation, mediation, feed 118 (and/or other network elements or combinations of network elements) performs rules for performing a service billing function, as described herein, and/or for performing a service/transactional revenue sharing function, as described herein. 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 assisted service usage information (e.g., micro-CDRs). 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 assisted service usage information.

[0070] 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.

[0071] In some embodiments, a settlement platform service is provided. For example, micro-CDRs can be aggregated and mediated to associate service usage for one or more services used by a communications device (e.g., a user of the communications device). A rules engine or another function can determine a revenue share allocation for the service usage for a particular service to determine the settlement for such service usage for the revenue sharing allocation/model and to distribute accounting and settlement information to one or more of carriers, distribution partners, MVNOs, wholesale partners, and/or other partners or entities. In some embodiments, the service is a transactional service.

[0072] 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., 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.

[0073] 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 assisted 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.

[0074] 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 assisted service usage information (e.g., micro-CDRs) includes a transaction type field or transaction code (e.g., indicating a type of service for the associated service usage information). For example, the rules engine can apply a rule or a set of rules based on the

identified service associated with the device generated service 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).

[0075] 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).

[0076] In some embodiments, the service controller 122 sends the device generated CDRs to the rules engine (e.g., a service usage data store and rules engine, such as CDR storage, aggregation, mediation, feed 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 (e.g., by network provision system 160) and behaves substantially similar to other CDR generators on the network).

[0077] In some embodiments, the service controller 122 is provisioned as a new type of networking function that is recognized as a valid, authorized, and secure source for CDRs by the other necessary elements in the network (e.g., CDR storage, aggregation, mediation, feed 118). In some embodiments, if the necessary network apparatus only recognize CDRs from certain types of networking equipment (e.g. a RAN gateway or transport gateway), then the service controller 122 provides authentication credentials to the other networking equipment that indicate that it is one of the approved types of equipment for 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.

[0078] 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 provides the device assisted service usage information (e.g., device based CDRs or micro-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), as it is not required to mediate network based CDRs and device assisted CDRs), and the device based service usage information is provided to the central billing interface 127 or the central billing system 123.

[0079] In some embodiments, the device based CDRs (e.g., micro-CDRs) and/or new CDRs generated based on execution of a rules engine as described herein are provided only for devices that are managed and/or based on device group, service plan, or any other criteria, categorization, and/or grouping, such as based on ambient service or ambient service provider or transactional service or transactional service provider.

[0080] In some embodiments, QoS for DAS includes a service processor (e.g., any device assisted element/function) that facilitates coordination for and/or provisions wireless access/radio access bearers (e.g., RABs). In some embodiments, the service processor determines whether a request for QoS is authorized (e.g., according to QoS service level, user standing, available local network capacity (as reported by other device(s) and/or network)). In some embodiments, device QoS capacity demand reports provide and/or augment network capacity demand reports.

[0081] In some embodiments, QoS for DAS includes a service controller (e.g., any network device based service control element/function) that facilitates coordination for and/or provisions wireless access/radio access bearers (e.g., RABs) on a device (e.g., a communications device, such as a mobile wireless communications device and/or an intermediate networking device), on network, and/or on device plus network. In some embodiments, the service controller provides device QoS capacity demand reports to other network equipment/elements/functions, and then also provisions the RAB channel based on various criteria and determinations.

[0082] In some embodiments, QoS for DAS provides for device assisted monitoring, information, and/or functionality to facilitate QoS without and/or to assist network based monitoring, information, and/or functionality (e.g., Deep Packet Inspection (DPI) and/or provides such monitoring, information, and/or functionality that may not be available via network based monitoring, information, and/or functionality (e.g., encrypted activities on the device may not be accessible by DPI or other network based techniques). For example, QoS for DAS can assist in the QoS setup to facilitate the QoS setup and provide such information that may not otherwise be available using network based only techniques. For example, device assisted activity and/or service monitoring techniques can assist in classifying the QoS for the monitored activity and/or service using, for example, a QoS activity map (e.g., as described herein or other similar techniques). For example, using such device assisted techniques eliminates and/or minimizes DPI or other network based techniques that can give rise to privacy concerns/issues, network neutrality concerns/issues, and/or otherwise may not be able to provide similar or equivalent granular service/activity monitoring, as discussed above, and/or also off loads such processing from the network (e.g., network elements/devices/functionality) to the communications devices (e.g., at least for such communications devices that can perform such functions, based on their processing and/or memory capabilities, as would be apparent to one of ordinary skill in the art). In some embodiments, QoS for DAS includes the service provider for providing an initial authorization/clearance for a QoS request (e.g., using various techniques described herein), and the service controller determines if the QoS request should be authorized (e.g., based on various QoS authorization/clearance/approval criteria (such as QoS activity maps and/or QoS request rule) and/or network capacity, as described herein). In some embodiments, QoS for DAS includes the service provider for providing a QoS request including a QoS class to

the service controller, and the service controller determines if the QoS request should be authorized, as described herein.

[0083] In some embodiments, QoS for DAS includes providing or facilitating reports for base station (BTS) for network capacity (e.g., sector, channel, busy state information or network capacity usage/availability, and/or network capacity expected demand) based on, for example, one or more of the following: monitored application usage on the communications device, monitored user activity on the communications device, location of the communications, other available networks, and/or other monitored or determined activity, service usage measure, and/or metric. In some embodiments, at or after execution of an application that is determined to require network service usage (e.g., may require increased wireless network bandwidth, such as based on a service usage activity map), QoS for DAS sends information to the network (e.g., a network controller or other network device element/function) that capacity demand is forthcoming for the communications device (e.g., potentially initiating a provisioning of a QoS radio access bearer (RAB) or other type of RAB).

[0084] In some embodiments, network capacity (e.g., busy state information) is collected from one or more communications devices in communication with a wireless network (e.g., network capacity/usage information measured from each respective communications device's perspective is determined and stored by the service processor on each respective communications device) and reported to the service controller, and the service controller (e.g., or another network element/function) uses this information to determine what resources are available for allocation to various levels of QoS (e.g., to respond to/facilitate various QoS requests) and/or to workload balance across multiple base stations and/or networks (e.g., cellular, Wi-Fi, and/or other wireless networks).

[0085] In some embodiments, the service processor executed on the communications device sends a QoS request (e.g., a wireless network bearer channel reservation request or Radio Access Bearer (RAB) request) to the service controller. The service controller verifies the request using various verification techniques as described herein. In some embodiments, the service controller facilitates coordination of various device QoS requests with one or more base stations (BTSs) in communication with the communications device to provide for the requested

QoS reservation to facilitate the new QoS session. In some embodiments, the service controller provides a QoS routing function by, for example, providing various QoS routing instructions to a device service processor (e.g., aggregating, prioritizing, queuing, authorizing, allocating reservations/RABs, denying, re-routing (such as to other BTSs and/or other networks) and/or otherwise managing QoS requests), in which the BTS may or may not be QoS aware. For example, QoS priority can be based on activity (e.g., service usage and/or application), service level, user standing, network capacity, time of day, and/or QoS priority can be purchased on a transaction basis, a session basis, a pre-pay basis or a plan basis. As another example, QoS priority can also vary by device type, user within a group, group, application type, content type, or any other criteria or measure and/or any combination thereof. In some embodiments, the service controller also facilitates coordination of various device QoS requests with other network elements/functions for QoS implementation and management to provide for an end to end QoS solution.

[0086] In some embodiments, QoS can be symmetric for two mobile devices or asymmetric. In some embodiments, QoS resource availability can be from communications devices, BTS(s), other network functions (e.g., service control, service controller and/or any other network elements/functions) or any combination thereof. In some embodiments, the service controller provides QoS demand information to another network element/function. In some embodiments, the service controller provides the central aggregator and policy decision point (PDP). In some embodiments, the service controller controls (e.g., at least in part) QoS related functions for communications devices, BTS(s), and/or a combination of both.

[0087] In some embodiments, charging (e.g., monitoring and/or determining associating charging or billing) for QoS service usage/transactions is determined using various techniques described herein. For example, the service processor can assist in charging for QoS activities. In some embodiments, the service processor uses device assisted Charging Data Records (CDRs) or micro-CDRs to assist in charging for QoS activities (e.g., using QoS class related transaction codes), as described herein with respect to various embodiments. In some embodiments, charging for QoS is performed in whole or in part by one or more network elements/functions (e.g., service controller, SGSN/GGSN/other gateways, and/or billing interfaces/servers).

[0088] In some embodiments, service usage information includes network based service usage information. In some embodiments, the network based service usage information includes network based CDRs. In some embodiments, service usage information includes device based service usage information. In some embodiments, device based service usage information includes device assisted CDRs, also referred to herein as micro-CDRs, as described herein. In some embodiments, micro-CDRs are used for CDR mediation or reconciliation that provides for service usage accounting on any device activity that is desired (e.g., providing granular service usage information, such as based on application layer service usage monitoring, transaction service usage monitoring, QoS activities/sessions/transactions, and/or other types of service usage information). In some embodiments, each device includes a service processor (e.g., a service processor executed on a processor of a communications device, such as a mobile device or an intermediate networking device that can communicate with a wireless network).

[0089] In some embodiments, each device activity that is desired to be associated with a billing event (e.g., for a QoS related billing event) is assigned a micro-CDR transaction code, and the service processor is programmed to account for that activity associated with that transaction code (e.g., various transaction codes can be associated with service usage associated with certain services, applications, and/or based on QoS classes or priorities, respectively, which can be used for providing granular service usage for these various Internet/network based services/sites/transactions and/or any other Internet/network based services/sites, which can include transactional based services). For example, using these techniques, as described herein, essentially any type of device activity (e.g., including QoS classes and prioritization) can be individually accounted for and/or controlled (e.g., throttled, restricted, and/or otherwise controlled as desired). In some embodiments, the service processor periodically reports (e.g., during each heartbeat or based on any other periodic, push, and/or pull communication technique(s)) micro-CDR usage measures to, for example, a service controller or some other network element/function. In some embodiments, the service controller reformats the heartbeat micro-CDR usage information into a valid CDR format (e.g., a CDR format that is used and can be processed by an SGSN or GGSN or some other authorized network element/function for CDRs) and then transmits the reformatted micro-CDRs to a network element/function for performing CDR mediation.

[0090] In some embodiments, CDR mediation is used to properly account for the micro-CDR service usage information by depositing it into an appropriate service usage account and deducting it from the user device bulk service usage account. For example, this technique provides for a flexible service usage billing solution that uses pre-existing solutions for CDR mediation and billing. For example, the billing system can process the mediated CDR feed from CDR mediation, apply the appropriate account billing codes to the aggregated micro-CDR information that was generated by the device, and then generate billing events in a manner that does not require changes to existing billing systems, infrastructures, and techniques (e.g., using new transaction codes to label the new device assisted billing capabilities).

[0091] In some embodiments, the various QoS techniques performed on or by the communications device (e.g., using a service processor to provide or assist in providing QoS session provisioning, QoS policy management, QoS policy enforcement, and/or QoS charging, such as QoS charging records and reports) are verified.

[0092] For example, a QoS request, QoS related policy rules (e.g., QoS activity map, QoS related service plan and/or service policy settings) and implementation, QoS policy enforcement, and QoS charging are verified (e.g., periodically, per transaction, and/or based on some other criteria/metric). In some embodiments, verification techniques include one or more of the following: compare a network based service usage measure with a first service policy associated with the communications device, compare a device assisted service usage measure with the first service policy, compare the network based service usage measure to the device assisted service usage measure, perform a test and confirm a device assisted service usage measure based on the test, perform a User Interface (UI) notification (e.g., which can include a user authentication, password, question/answer challenge, and/or other authentication technique) and other similar verification techniques as will now be apparent. Accordingly, in some embodiments, QoS for DAS "closes the loop" for verification of various QoS related techniques, such as QoS requests, QoS grants, QoS usage, and/or QoS charging. In some embodiments, the service processor and the service controller serve as a verifiable QoS management/coordination system for other QoS elements/functions in network. In some embodiments, if such or other verification techniques determine or assist in determining that a QoS request, QoS report, and/or QoS policy behavior does not match expected requests, reports, and/or policy, then responsive

actions can be performed, for example, the communications device can be suspended, quarantined and/or flagged for further analysis/scrutiny to determine whether the device is malfunctioning, needs updating, has been tampered with or compromised, is infected with malware, and/or if any other problem exists.

[0093] In some embodiments, the communications device (e.g., the service processor) maintains a QoS flow table that associates or maps device activity to QoS level/class to RAB/QoS channel, and in some embodiments, the communications device also informs a QoS management network function/element of the relative priority of the QoS flows for the communications device (e.g., based on or using the QoS flow table). In some embodiments, the service controller receives or collects information from the communications device and maintains such a QoS flow table for the communications device and in some embodiments, the service controller also informs a QoS management network function/element of the relative priority of the QoS flows for the communications device (e.g., based on or using the QoS flow table). In some embodiments, flows can be assigned to activities originating at the communications device in a transparent way, or simply by activity class or user preference or using other techniques.

[0094] In some embodiments, the communications device maintains a table of QoS billing rates, scheduled transmission times, and/other QoS related information to implement an overlay MAC at the data networking level to manage QoS on legacy networks that are not QoS MAC enabled and/or do not have the various functionality to support QoS controls (e.g., and such techniques can also be used to provide for QoS functionality across different networks). In some embodiments, QoS related policies are exchanged between roaming and home service controllers to facilitate QoS support while roaming on a non-home network(s).

[0095] In some embodiments, the communications device serves as a network capacity indicator (e.g., collecting network capacity information for a local cell and communicating or reporting that network capacity information to the service controller). For example, permanent local cell communications devices can be placed in local cell areas to augment legacy equipment for such network capacity indicator/reporting functions.

[0096] In some embodiments, service partners and/or service providers can subsidize in whole or in part to upgrade a given user or group of users to better QoS related service level agreement(SLA)/class for a preferred destination. In some embodiments, based on monitored service usage and/or other monitored behavior of the communications device, such subsidized QoS upgrade/offers can be presented to a user of the communications device (e.g., as an incentive/reward for desired or preferred user behavior or for other reasons).

[0097] In some embodiments, QoS charging is based on QoS channel/reservation, service flow, or RAB charging (e.g., single flow per RAB, multi-flow per RAB, multi-RAB per flow). In some embodiments, charging is based on one or more of the following: user service class request, traffic volume and class, time and class, network capacity (e.g., busy state) and class, time of day and class, location, traffic type, application type, application class, destination, destination type, partner service, and/or other criteria/measures. In some embodiments, QoS charging is verified using the various verification techniques described herein (e.g., test charging events). In some embodiments, QoS charging is by data usage (e.g., by Megabyte (MB)), service flow by time by QoS class, speed by time, and/or other criteria/measures.

[0098] In some embodiments, QoS for DAS includes coordinating functions with one or more of the following: DAS elements/functions, Radio Access Network (RAN), Transport network, Core network, GRX network, IPX network, and/or other networks/elements/functions.

[0099] **Figure 2** illustrates a functional diagram of another network architecture for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS techniques described herein are implemented using the network architecture shown in Figure 2.

[00100] As shown, Figure 2 includes various devices 100 including service processors 115. For example, devices 100 can include various types of mobile devices, such as phones, PDAs, computing devices, laptops, netbooks, tablets, cameras, music/media players, GPS devices, networked appliances, and any other networked device; and/or devices 100 can include various types of intermediate networking devices, as described herein. The devices 100 are in communication with service control 210 and central provider access and core networks 220. Service policies and accounting functions 230 are also provided in communication with the

central provider access and core networks 220. For example, devices 100 can communicate via the central provider access and core networks 220 to the Internet 120 for access to various Internet sites/services 240 (e.g., Google sites/services, Yahoo sites/services, Blackberry services, Apple iTunes and AppStore, Amazon.com, FaceBook, and/or any other Internet service or other network facilitated service).

[00101] In some embodiments, Figure 2 provides a wireless network architecture that supports partitioned device groups, in which each device group can be provided independent and secure management of transparent reconciliation. Those of ordinary skill in the art will appreciate that various other network architectures can be used for providing device group partitions and a settlement platform, and Figure 2 is illustrative of just another such example network architecture for which device group partitions and settlement platform techniques described herein can be provided.

[00102] In some embodiments, a service provider selects who receives a reconciliation report of activations and usage by service plan type. In some embodiments, service usage information (e.g., based on CDRs and/or micro-CDRs or other service usage measures) are used for service plan billing and for reconciliation reports. In some embodiments, different service plans on the same device (e.g., device 100) can be sent to different partners or the same partner. In some embodiments, multi-device and multi-user reconciliation capabilities are provided. In some embodiments, a settlement platform service is provided. In some embodiments, various revenue share techniques as described herein are provided (e.g., implemented using a settlement platform service, using, for example, service policies and accounting functions 230).

[00103] In some embodiments, partitioned device groups are provided. In some embodiments, each partitioned group of devices (e.g., mobile devices 100) can be uniquely managed with secure admin log-ins. In some embodiments, multi-device, multi-user accounting is provided. In some embodiments, capabilities are provided to support multi-party/multi-service reconciliation records to carriers and carrier partners, which can also support various service/transactional revenue share techniques (e.g., for reducing or eliminating the up-front subsidy and associated up-front subsidy risk of certain bounty models). In some embodiments, service usage and profitability analytics are provided (e.g., using aggregated CDRs/micro-CDRs

and service policies and accounting functions 230). For example, a partitioned beta test group of devices can be tested and optimized for various service usage policies and/or service plans, and then the optimized service usage policies and/or service plans can be published to an entire or larger device group. In some embodiments, a carrier can be provided a carrier branded device group, and/or a MVNO can be provided a MVNO branded device group.

[00104] **Figure 3** illustrates another functional diagram of a QoS for DAS architecture 300 including a device based service processor 115 and a service controller 122 for providing quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS techniques described herein are implemented using the functions/elements shown in Figure 3.

[00105] 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 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 3 are described below with respect to Figures 10 and 11.

[00106] As shown in Figure 3, 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.

[00107] As shown in Figure 3, 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 3, 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.

[00108] 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 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.

[00109] As shown in Figure 3, the service controller 122 includes an access control integrity server 1654 (e.g., service policy security server). 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.

[00110] 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 (e.g., service policy security agent) 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.

[00111] 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 QoS data passed, QoS 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.

[00112] 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 QoS service measure and QoS 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 QoS 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.

[00113] As shown in Figure 3, service controller 122 includes a service history server 1650 (e.g., charging server). 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 (e.g., CDR feed and CDR mediation). 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.

[00114] As shown in Figure 3, service controller 122 includes a QoS policy management server 1652 (e.g., policy decision point (PDP) server). In some embodiments, the QoS 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.

[00115] 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.

[00116] As shown in Figure 3, 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.

[00117] As shown in Figure 3, service controller 122 includes a beta test server 1658 (e.g., policy creation point and beta test server). 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.

[00118] As shown in Figure 3, service controller 122 includes a service download control server 1660 (e.g., service software download control server). 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.

[00119] As shown in Figure 3 service controller 122 includes a billing event server 1662 (e.g., micro-CDR server). 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.

[00120] As shown in Figure 3, the Access Network HLR 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).

[00121] As shown in Figure 3, 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.

[00122] As shown in Figure 3, the central billing 1619 (e.g., central provider billing server) 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.

[00123] As shown in Figure 3, in some embodiments, modem selection and control 1811 (e.g., in communication with connection manager 1804 as shown) 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.

[00124] 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.

[00125] As shown in Figure 3, 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 3, 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.

[00126] As shown in Figure 3, service processor 115 includes a QoS API and OS stack interface 1693. In some embodiments, QoS API and OS stack interface 1693 provides the QoS API functionality as similarly described herein with respect to various embodiments. In some embodiments, the QoS API is used to report back QOS availability to applications. As shown, service processor 115 also includes a QoS router 1698 (e.g., QoS router agent/function) and a

policy decision point (PDP) agent 1692. In some embodiments, QoS router 1698 provides the QoS router functionality as similarly described herein with respect to various embodiments. In some embodiments, the QoS router supports multiple QoS channels (e.g., one or more provisioned/allocated QoS links forming a QoS channel between the device and the desired end point, such as an access point/BTS/gateway/network for a single ended QoS channel or other communication device for an end to end QoS channel, depending on the QoS connection/network support/availability/etc.). In some embodiments, the QoS router supports multiple QoS channels, which can each have different QoS classes/levels. In some embodiments, the QoS router routes application/service usage traffic to an appropriate QoS channel. In some embodiments, the QoS router determines the routing/mapping based on, for example, one or more of the following: a QoS API request, a QoS activity map, a user request, a service plan, a service profile, service policy settings, network capacity, service controller or other intermediate QoS network element/function/device, and/or any other criteria/measure, as similarly described herein with respect to various embodiments. In some embodiments, multiple different applications/services are routed to a particular QoS channel using various techniques described herein. In some embodiments, different applications/services are routed to different QoS channels using various techniques described herein. In some embodiments, the QoS router assists in managing and/or optimizing QoS usage for the communications device. In some embodiments, the QoS router assists in managing and/or optimizing QoS usage across multiple communications devices (e.g., based on network capacity for a given cell area/base station or other access point). In some embodiments, PDP agent 1692 provides the PDP agent functionality as similarly described herein with respect to various embodiments. As shown, QoS for DAS architecture 300 also includes a suspend resume interface 320, network QoS provisioning interfaces 300 in the device service processor 115; an activation/suspend resume server 340 and billing event server in the service controller 122; and a suspend/resume interface 320 and network QoS provisioning interfaces 330 for providing the various QoS techniques described herein.

[00127] 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 (e.g., charging agent), 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 (not shown), 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, and/or any of the various other DAS related techniques as described herein with respect to various embodiments.

[00128] 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 1663 as shown in Figure 16. 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.

[00129] **Figures 4A through 4C** illustrates a functional diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS techniques described herein are implemented using the network architecture shown in Figures 4A through 4C.

[00130] Referring to Figure 4A, in some embodiments, QoS functionality is performed at the communications device 100 using service processor 115 as similarly described herein. For example, the service processor 115 determines whether or not a QoS request is authorized (e.g., based on the associated service plan and/or other criteria/measures). If the QoS request is

authorized, then the service processor 115 communicates with the base station (BTS) 125 to send the QoS request (e.g., a RAB or multi-RAB reservation request) to the local BTS. The BTS request determine with to accept or deny the QoS request (e.g., based on network capacity, such as using a first come first service QoS/network bandwidth or best effort access policy or other techniques, and/or other criteria/measures). The BTS responds to the QoS request accordingly. If the QoS request is granted, the QoS session can be initiated as similarly described herein. In some embodiments, the service processor 115 also performs various QoS charging functions using various techniques described herein, and the service processor 115 periodically sends QoS charging records or reports to the service controller 122. In some embodiments, the service processor 115 and the QoS related functions performed by the service processor 115 are periodically verified using the various techniques described herein.

[00131] Referring to Figure 4B, Figure 4B is similar to Figure 4A except that the service controller 122 is also shown to be in communication with the service processor 115 of the communications device 100, which can provide for the download and periodically updating of the QoS rules and/or other service plan/profile/policy information that can include QoS related information. In some embodiments, the service processor 115 also performs various QoS charging functions using various techniques described herein, and the service processor 115 periodically sends QoS charging records or reports to the service controller 122. In some embodiments, the service processor 115 and the QoS related functions performed by the service processor 115 are periodically verified using the various techniques described herein.

[00132] Referring to Figure 4C, at 410, the service processor 115 sends a QoS request to the service controller 122 (e.g., the service processor can also (at least in part) determine whether the QoS request is authorized as similarly described with respect to Figure 4A). At 420, the service controller 122 sends the QoS request to the BTS 125 if it is determined that the QoS request is authorized using various techniques described herein and/or whether the BTS 125 has network capacity for the QoS request. For example, the service controller can provide a central policy decision point function for QoS related activities (e.g., based on QoS prioritization, network capacity, and/or other criteria/measures/policies). At 430, the service controller 122 communicates the response to the QoS request accordingly. At 440, if the QoS request was approved, the device 100 initiates the QoS session (e.g., using a RAB or multi-RAB reservation)

via the BTS. In some embodiments, the service processor 115 also performs various QoS charging functions using various techniques described herein, and the service processor 115 periodically sends QoS charging records or reports to the service controller 122. In some embodiments, the service processor 115 and the QoS related functions performed by the service processor 115 are periodically verified using the various techniques described herein.

[00133] In some embodiments, QoS techniques as described herein are implemented in the device (e.g., using the service processor 115) and one or more other network elements/functions, such as the BTS 125, service controller 125, RAN, SGSN/GGSN/other gateways and/or other network elements/functions, in which various of the QoS related functions can be distributed or allocated to such network elements/functions based on various design/network architecture approaches as will now be apparent to one of ordinary skill in the art, in which QoS related activities and/or functions at the device 100 are verified using various verification techniques described herein.

[00134] In some embodiments, the device determines QoS availability by directly querying QOS link reservation equipment in the network (e.g., an access point, such as the BTS). In some embodiments, the device determines QoS availability based on an intermediate network function that coordinates QoS requests with one or more network QoS link resources. In some embodiments, the device requests a QoS reservation in advance of QOS link establishment with one or more QoS network link resources. In some embodiments, in response to a QoS request, a QoS channel is reported as available only if/after it is determined that the necessary one or more QoS links required to create the QOS channel are available, and, for example, the QoS channel can then be reserved based on a confirmation or automatically be reserved in response to the QoS request.

[00135] **Figure 5** illustrates a functional diagram for generating a QoS activity map for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In particular, Figure 5 illustrates techniques for mapping a service plan or a set of service plan policies/rules for QoS 510 to a set of QoS activity rules 530. As shown, a set of QoS rules/QoS related device state information 510 (e.g., a set of associated service plan, service plan usage, other state such as network capacity or forecasted demand or time of day/day of

week, activity usage, QoS level, and/or user preferences) is mapped using a QoS mapping function to a set of QoS activity rules 530 using various techniques described herein. At 530, activity rules (e.g., activity policy rules instructions) 530 are determined using the mapping function 520.

[00136] In some embodiments, the service plan includes a list of activity policies, and each activity policy in the service plan specifies how the activity policy is modified by rules state information. In some embodiments, each activity policy then becomes the instruction for the engine (e.g., QoS mapping function 520) that maps activity policy to QoS activity rules 530. In some embodiments, service controller 122 downloads QoS mapping function 520, which is implemented by service processor 115.

[00137] In some embodiments, the service processor determines (e.g., and classifies) application/service usage activity demand with or without granular application/service usage activity (e.g., depending on various user/service plan/service provider/network/legal and/or other privacy restrictions and/or any other related requirements or settings). For example, policies (e.g., service policy settings and/or service profile settings) can be downloaded to provide such application/service usage activity monitoring rules and a QoS activity map for assigning such monitored activities to various QoS classes or priorities, and, in some embodiments, such monitoring and the QoS activity map can also be implemented using various verification techniques described herein (e.g., periodically audited, tested, compared with network service usage information). In some embodiments, the QoS activity map is based on a service plan, service profile, and/or service policy settings associated with the communications device. In some embodiments, the QoS activity map is based on a device group and/or user group. In some embodiments, the QoS activity map is based on user input (e.g., a user of the communications device can identify QoS classes/service levels for various applications and/or service activities, in response to requests for user input, based on user configurations, user defined rules (e.g., to eliminate or mitigate privacy and/or net neutrality concerns/issues), and/or confirmed monitored user behavior QoS related patterns or preferences). In some embodiments, the QoS activity map includes mappings/associations based on one or more of the following: a user preference for a given destination, destination class, application, application class (e.g., by application class instead of with respect to a specific application can also eliminate or mitigate privacy and/or net

neutrality concerns/issues), flow, traffic or flow class, time period, time of day, location, network busy state (e.g., provide QoS when you can, then charge more when busy, notify user of busy state), device type, user type, user plan, user group, user standing, partner service, tokens, service type, and/or other criteria or measures.

[00138] In some embodiments, various techniques described herein are managed for device 100 for incoming and/or outgoing QoS requests. In some embodiments, as shown in Figure 6, QoS for DAS includes establishing an end to end coordinated QoS service channel control.

[00139] **Figure 6** illustrates a functional diagram for quality of service (QoS) for device assisted services for an end to end coordinated QoS service channel control in accordance with some embodiments. As shown in Figure 6, a wireless communications device 100A includes a service processor 115A in secure communication with service controller 122A. A wireless communications device 100B includes a service processor 115B in secure communication with service controller 122B. In some embodiments, when, for example, device 100A initiates a QoS request for a QoS class session in communication with device 100B (e.g., a VOIP call or another application service requiring or possibly using a QoS class/level session, such as a conversational or other QoS type of class/level), as sequence of actions are performed using service controller 122A and service controller 122B to facilitate/setup an end to end coordinated QoS service channel control. In some embodiments, as similarly described herein, assuming that service processor 115A and service controller 122A determine that the QoS request from device 100A is authorized for that device, then the service controller 122A contacts registry 650 (e.g., a device registry, such as an HLR, mobile services center, or other central database or registry including, for example, service controller mappings by device/IP address/other) to determine the service controller associated with/responsible for managing QoS/service control for device 100B. The registry 650 provides the service controller 122B information (e.g., IP address/other address) based on this lookup determination. In some embodiments, service controller 122A then initiates the QoS request with service controller 122B to determine if the device 100B is authorized and/or available for the QoS session requested by device 100A. In some embodiments, service controllers 122A/B communicate with BTSs 125A/B to determine whether the QoS request can be facilitated (e.g., based on network capacity) as similarly described herein. In some

embodiments, the service controllers 122A/B provide the central QoS coordination function and can request appropriate QoS channels directly from the respective local BTSs. In some embodiments, the service controllers 122A/B also communicate with one or more of the following network elements/functions as shown in Figure 6 in order to facilitate an end to end coordinated QoS service channel control: RAN 610/670, Core Network 620/660, and IPX network 630. In some embodiments, service controllers 122A/B communicate with various necessary network element for provisioning to facilitate session provisioning through the carrier core network as similarly discussed above. In some embodiments, service controllers 122A/B communicate with various necessary network element for provisioning to facilitate session provisioning through the IPX network as similarly discussed above. As will be apparent to one of ordinary skill in the art, QoS for DAS techniques as described herein can be similarly implemented using these or similar techniques to various other network architectures.

[00140] **Figure 7** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. At 702, the process begins. At 704, QoS rules are received or determined (e.g., a service processor receives or requests the QoS rules, which may be included in service plan, service profile, and/or service policy settings associated with the communications device). In some embodiments, the QoS rules are verified using various techniques as described herein (e.g., periodically updated, replaced, downloaded, obfuscated, and/or tested using by a service controller and/or using other verification techniques). In some embodiments, a QoS API is also used by various applications to initiate a QoS request, as described herein with respect to various embodiments. In some embodiments, the QoS rules are implemented in the form of a QoS activity map in accordance with various embodiments described herein. At 706, the communications device's standing for QoS is determined using various techniques described herein (e.g., based on the service plan, service profile, service policy settings, QoS rules, based on QoS class, current service usage, current billing standing, and/or any other criteria/measure). In some embodiments, in addition to verify the device/user standing for the QoS request, whether the device is following or in compliance with an assigned QoS reservation request policy is also verified using various techniques described herein. If the device is determined to not be eligible for QoS, then at 708, the device User Interface (UI) provides information concerning the denial/ineligibility for QoS session(s) (e.g., denial/ineligibility explanation and/or options for providing for one or more QoS options,

such as a service plan upgrade or payment for a certain/set of/period of time for QoS session(s) access). If the device is determined to be eligible for QoS, then at 710, QoS availability is determined (e.g., based on network capacity, which may be determined at the device, via communication with the service controller, via communication with the BTS, and/or any combination thereof, using the various techniques described herein). If QoS is determined to not be available, then at 712, the UI provides information and/or options concerning the QoS availability (e.g., unavailability explanation and/or options for providing for one or more QoS options, such as a service plan upgrade or payment for a certain/set of/period of time for QoS session(s) access). If QoS is determined to be available, then at 714, a request for network resources for the QoS session is sent to one or more network resources (e.g., service controller, BTS, gateway, core/transport network, IPX/GRX networks, and/or other network elements/functions/resources). At 716, a confirmation of the approved QoS session is received to close the loop for the QoS for DAS (e.g., a QoS schedule is received that provides the QoS session confirmation information, such as a scheduled RAB/multi-RAB and/or other reserved network resource(s) by schedule/other criteria). At 718, one or more verification techniques are performed to verify the QoS for DAS implementation on the device using various verification techniques described herein (e.g., comparing QoS service usage reports from a network source with the associated device policy; comparing QoS service usage reports from a network source with the QoS service usage reports from the device, and/or using other verification techniques as similarly described herein). At 720, the process is completed.

[00141] **Figure 8A** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. At 802, the process begins. In some embodiments, the QoS policies are implemented on the device (e.g., service processor collects/receives an associated service plan that defines/specifies basic policies for QoS, which can include a QoS activity map, which, for example, maps QoS classes based on application, service usage, flow type, destination, time of day, network capacity, and/or other criteria/measures, as similarly described herein). In some embodiments, a QoS API is also used by various applications to initiate a QoS request, as described herein with respect to various embodiments. In some embodiments, the QoS rules are implemented in the form of a verified QoS activity map in accordance with various embodiments described herein. At 804, a QoS request is determined (e.g., by QoS class for a particular associated service/application). In some

embodiments, the QoS request is determined at least in part by using the QoS activity map using various techniques described herein, for example, based on service/application usage monitoring on the device (e.g., by the service processor service usage monitoring agent). In some embodiments, the QoS request is determined based on the QoS API. In some embodiments, the QoS request is determined to be associated with an outgoing connection or an incoming connection. At 806, whether the QoS request is authorized is determined (e.g., whether the QoS request supported by the service plan, sufficient charging credit exists for this QoS request, and/or other criteria/measures). If not, then at 808, the UI provides a responsive notification and/or option as similarly described herein. If the QoS request is approved, then at 810, a request for network resources for the QoS session is sent to one or more network resources (e.g., service controller, BTS, gateway, core/transport network, IPX/GRX networks, a/another service controller in communication with another communications device such as for setting up a conversational class QoS connection with the other communications device, and/or other network elements/functions/resources). If the device is determined to be eligible for QoS, then at 810, QoS availability is determined (e.g., based on network capacity, which may be determined at the device, via communication with the service controller, via communication with the BTS, and/or any combination thereof, using the various techniques described herein). If QoS is determined to not be available, then at 812, the UI provides information and/or options concerning the QoS availability (e.g., unavailability explanation and/or options for providing for one or more QoS options, such as a service plan upgrade or payment for a certain/set of/period of time for QoS session(s) access). If QoS is determined to be available, then at 814, a request for network resources for the QoS session is sent to one or more network resources (e.g., service controller, BTS, gateway, core/transport network, IPX/GRX networks, and/or other network elements/functions/resources, to setup, for example, a QoS end to end connection – coordinate all resources end to end for the approved and verified QoS flow). At 816, a confirmation of the approved QoS session is received to close the loop for the QoS for DAS (e.g., a QoS schedule is received that provides the QoS session confirmation information, such as a scheduled RAB/multi-RAB and/or other reserved network resource(s) by schedule/other criteria). At 818, a QoS router is executed/performed on the communications device to assist in implementing QoS for DAS using various verification techniques described herein (e.g., to perform QoS queuing, throttling, and/or other QoS router related functions as described herein). At 820, verified QoS

charging is performed (at least in part) on the device using various techniques described herein (e.g., using the service processor, such as the charging/service usage monitoring and/or other agents as described herein). In some embodiments, QoS charging records and/or reports are provided to one or more network elements for managing QoS billing and/or other QoS management/billing related service control functions (e.g., to the service controller and/or the billing interface or billing server). In some embodiments, QoS for DAS also facilitates reestablishing the QoS session/connection/channel/stream if the QoS session/connection/channel/stream is lost or goes down, using similar techniques to those described herein as would be apparent to one of ordinary skill in the art. At 822, the process is completed. In some embodiments, the QoS provisioning channel is closed when the device session is over to, for example, free up various resources.

[00142] **Figure 8B** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS includes identifying the QoS requirements (e.g., QoS level or QoS class) for a service activity. At 824, the process begins. In some embodiments, the QoS policies are implemented on the device (e.g., service processor collects/receives an associated service plan that defines/specifies basic policies for QoS, which can include a QoS activity map, which, for example, maps QoS classes based on application, service usage, flow type, destination, time of day, network capacity, and/or other criteria/measures, as similarly described herein). In some embodiments, the QoS rules are implemented in the form of a verified QoS activity map in accordance with various embodiments described herein. At 826, the device monitors device activity, such as service/application usage activities. In some embodiments, the device detects the relevant activities based on various service usage monitoring techniques described herein. At 828,a QoS request is determined, for example, using various techniques described herein. At 830, a QoS level is determined based on the application associated with the QoS request using various techniques described herein. For example, the QoS level can be determined using the QoS activity map, which provides a QoS policy defined by a table associating various QoS levels with a variety of activities that include various device monitored service usage/application activities. In some embodiments, the QoS activity map includes QoS level mappings based on one or more of the following: application, destination/source, traffic type, connection type, content type, time of day/day of week, network capacity, activity usage, service plan selection,

current standing, user class, device class, home/roaming, network capabilities, and/or other criteria/measures as similarly described herein. In some embodiments, at 832, if the QoS level cannot be determined and/or in order to confirm a QoS level or selection among multiple potential appropriate/approved QoS levels, the UI presents options for a user to select the QoS level. At 834, the QoS request is initiated for the determined QoS level (e.g., QoS class). At 836, the process is completed.

[00143] **Figure 8C** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, QoS for DAS includes determining whether the network should grant the QoS request for a given device activity. At 842, the process begins. At 844, QoS request is determined. At 846, the communications device's standing for QoS is determined using various techniques described herein (e.g., a service processor in combination with a service controller or based on a communication for authorization of the QoS request sent to the service controller determines whether the QoS request is authorized, which can be based on the service plan, service profile, service policy settings, QoS rules, based on QoS class, current service usage, current billing standing, and/or any other criteria/measure). If the device is determined to not be eligible for QoS, then at 848, the device User Interface (UI) provides information concerning the denial/ineligibility for QoS session(s) (e.g., denial/ineligibility explanation and/or options for providing for one or more QoS options, such as a service plan upgrade or payment for a certain/set of/period of time for QoS session(s) access). If the device is determined to be eligible for QoS, then at 850, QoS availability is determined (e.g., based on network capacity, which may be determined at the device, via communication with the service controller, via communication with the BTS, and/or any combination thereof, using the various techniques described herein). If QoS is determined to not be available, then at 852, the UI provides information and/or options concerning the QoS availability (e.g., unavailability explanation and/or options for providing for one or more QoS options, such as a service plan upgrade or payment for a certain/set of/period of time for QoS session(s) access). If QoS is determined to be available, then at 854, a request for network resources for the QoS session is sent to one or more network resources (e.g., service controller, BTS, gateway, core/transport network, IPX/GRX networks, and/or other network elements/functions/resources can be queried directly and/or a centralized QoS resource/network function/element/database can be queried for determining such network resources and

coordinating such scheduling). At 856, a confirmation of the approved QoS session is received to close the loop for the QoS for DAS (e.g., a QoS schedule is received that provides the QoS session confirmation information, such as a scheduled RAB/multi-RAB and/or other reserved network resource(s) by schedule/other criteria). At 858, a QoS router is performed. In some embodiments, the QoS router is performed on the device (e.g., service processor), on a network element/function (e.g., service controller), and/or in combinations thereof. In some embodiments, the QoS router prioritizes multiple QoS requests across a given communications device. In some embodiments, the QoS router prioritizes multiple QoS requests across multiple communications devices and/or across multiple BTSs. In some embodiments, the QoS router performs various QoS class degradation, promotion, and/or other throttling related techniques as similarly described herein (e.g., based on session priority, network capacity, workload balancing, QoS priority rules, and/or other criteria/measures/rules). At 860, the process is completed.

[00144] **Figure 9** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, includes QoS session provision for a service activity. At 902, the process begins. At 904, a new QoS session is granted and/or confirmed. At 906, a device service processor (e.g., policy decision point (PDP) agent, also referred to herein as a policy control agent) maps the QoS session grant to a QoS monitoring policy (e.g., based on a service controller provided QoS related policy, based on a service plan associated with the device, user, device/user group, and/or other criteria/measures, as similarly described herein). At 908, the QoS monitoring policy provides commands/instructions to a policy enforcement point (PEP) (e.g., PEP agent, also referred to herein as a policy implementation agent) for managing/enforcing the new QoS priorities/sessions. At 910, the PEP determines whether to allow, block, throttle, and/or queue priority a session based on the QoS monitoring policy. At 912, the process is completed.

[00145] **Figure 10** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, Radio Access Bearer (RAB) support is available, and the following process is performed in accordance with some embodiments. At 1002, the process begins. At 1004, the device service processor detects a QoS request or QoS need (e.g., a QoS API request, a QoS request or need/benefit of QoS session based on service usage monitoring, such as by application, or other service usage

measure/activity). At 1006, the service processor and/or the service processor in communication with the service controller determines if the service plan allows/supports the requested QoS. If not, then at 1008, a UI event is generated (e.g., notifying the device user that such QoS/QoS level/class is not available, and potentially offering a QoS/service plan upgrade/purchase for that QoS/QoS level/class). At 1010, the service processor communicates the QoS request to the service controller (e.g., using a secure service control link or secure communication channel, as similarly described herein) to request the QoS level/class. At 1012, the service controller determines whether network resources are available using various techniques as described herein. In some embodiments, network capacity is determined using various techniques, such as local device measurements; dedicated local device measurement reports; BTS reports; other network element reports; by assessing, for example, a combination of one or more of available bandwidth, traffic delay or latency, available QoS level, variability in available bandwidth, variability in latency, and/or variability in available QoS level; and/or other techniques as described herein. At 1014, the service controller responds to the QoS request (e.g., grants or denies the QoS request). In some embodiments, another UI event is generated if the QoS request is denied as similarly described herein. At 1016 (assuming the QoS request is granted), the device requests a QoS channel from the BTS. In some embodiments, the request includes a QoS request authorization code received from the service controller. In some embodiments, the service controller provides a notification of the QoS request approval for the communications device to the BTS, so that the BTS can verify the approval of the QoS request. In some embodiments, the BTS confirms the device QoS channel request directly with the service controller. For example, various other techniques for verifying the QoS channel request can also be used as similarly described herein and as would be apparent to one of ordinary skill in the art. In some embodiments, the device service processor and/or service controller provides QoS related reports informing the BTS of how many QoS channels (e.g., RABs) to provision and how many best effort resources to provision based on device demand projections. At 1018 (assuming the QoS channel request is verified), the QoS session is initiated based on an allocated RAB or multi-RAB reservation received from the BTS (e.g., and/or other network elements as similarly described herein). At 1020, the process is completed.

[00146] **Figure 11** illustrates a flow diagram for quality of service (QoS) for device assisted services (DAS) in accordance with some embodiments. In some embodiments, RAB

support is not available, and the following process is performed in accordance with some embodiments. At 1102, the process begins. At 1104, the device service processor detects a QoS request or QoS need (e.g., a QoS API request, a QoS request or need/benefit of QoS session based on service usage monitoring, such as by application, or other service usage measure/activity). At 1106, the service processor and/or the service processor in communication with the service controller determines if the service plan allows/supports the requested QoS. If not, then at 1108, a UI event is generated (e.g., notifying the device user that such QoS/QoS level/class is not available, and potentially offering a QoS/service plan upgrade/purchase for that QoS/QoS level/class). At 1110, the service processor communicates the QoS request to the service controller (e.g., using a secure service control link or secure communication channel, as similarly described herein) to request the QoS level/class. At 1112, the service controller determines whether network resources are available using various techniques as described herein. In some embodiments, network capacity is determined using various techniques, such as local device measurements, BTS reports, other network element reports, and/or other techniques as described herein. In some embodiments, the service controller throttles other devices on the link so that the requested QoS level can be achieved (e.g., as RAB support is not available). In some embodiments, the service controller time slots traffic from the device end in synchronization with a BTS clock or absolute clock to facilitate the requested QoS level and to achieve necessary network capacity to support/facilitate the requested QoS level (e.g., minimizing jitter/inter-packet delay variation) based on current/forecasted network capacity on the link. At 1114, the service controller responds to the QoS request (e.g., grants or denies the QoS request). In some embodiments, another UI event is generated if the QoS request is denied as similarly described herein. At 1116 (assuming the QoS request is granted), the device initiates the QoS session. At 1118, the device service processor and/or the device service processor in secure communication with the service controller monitors and verifies the QoS session using various monitoring and verification techniques described herein (e.g., checks CDRs to determine if the QoS channel is properly implemented by the device). In some embodiments, a UI event is generated to notify the device user if there are potential problems with the QoS session implementation, to periodically inform the user of QoS charging, and/or other events/information related to QoS activities. At 1120, the process is completed.

[00147] **Figure 12** illustrates a device stack providing various service usage measurement from various points in the networking stack for a service monitor agent (e.g., for monitoring QoS related activities as described herein), a billing agent, and an access control integrity agent to assist in verifying the service usage measures, QoS related activities and functions, 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 driver/agent 1690 (e.g., policy enforcement point driver/agent), 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.

[00148] 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.

[00149] 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).

[00150] 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 (e.g., QoS 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 QoS 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.

[00151] As shown in Figure 12, the application service interface layer (e.g., QoS 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.

[00152] 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.

[00153] **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.

[00154] 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.

[00155] 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.

[00156] WHAT IS CLAIMED IS:

CLAIMS

1. A system, comprising:

a processor of a communications device configured to:

determine a quality of service (QoS) request for a service over a wireless network; and

verify the QoS request for the service over the wireless network;

a memory coupled to the processor and configured to provide the processor with instructions.

2. The system recited in claim 1, wherein the communications device is a mobile communications device or an intermediate networking device, and the service includes one or more Internet based services.

3. The system recited in claim 1, wherein the communications device is a mobile communications device, and the service includes one or more Internet based services, and wherein the mobile communications device includes one or more of the following: a mobile phone, a PDA, an eBook reader, a music device, an entertainment/gaming device, a computer, laptop, a netbook, a tablet, and a home networking system.

4. The system recited in claim 1, wherein the service supports one or more of the following service levels: conversational, streaming, interactive data, and background data.

5. The system recited in claim 1, wherein the QoS request is verified based on verified QoS access rules and/or based on verified service usage monitoring.

6. The system recited in claim 1, wherein the processor is further configured to:

receive the QoS request through a QoS application programming interface (API).

7. The system recited in claim 1, wherein the processor is further configured to:

monitor use of the service; and

determine the QoS request based on the monitored use of the service.

8. The system recited in claim 1, wherein the processor is further configured to:

monitor use of the service using a service processor; and

determine the QoS request based on the monitored use of the service, wherein the QoS request is determined based on one or more of the following: an application activity, a service activity, and a pattern of application or service activity.

9. The system recited in claim 1, wherein the processor is further configured to:

monitor use of the service using a service processor;

determine the QoS request based on the monitored use of the service; and

execute a user interface notification if the QoS request is determined, wherein the user notification includes one or more of the following: a confirmation of the QoS request, a global confirmation for the QoS request and potential future similar types of QoS requests; an option to purchase a new service level for the QoS request, and an option to upgrade to a new service plan.

10. The system recited in claim 1, wherein the processor is further configured to:

monitor use of the service to determine an incoming QoS request or an outgoing QoS request.

11. The system recited in claim 1, wherein the processor is further configured to:

implement a service profile for assisting control of the communications device use of the service on the wireless network, wherein the service profile includes a plurality of service policy settings, and wherein the service profile is associated with a service plan that specifies access to the service;

monitor use of the service based on the service profile; and

determine the QoS request based on the monitored use of the service.

12. The system recited in claim 1, wherein the processor is further configured to:

determine if the QoS request is authorized based on a service plan associated with the communications device.

13. The system recited in claim 1, wherein the processor is further configured to:

determine if the QoS request is authorized based on verified QoS access rules, wherein the verified QoS access rules are associated with a service plan for the communications device.

14. The system recited in claim 1, wherein the processor is further configured to:

receive QoS access rules from a service controller, wherein the QoS access rules are associated with a service plan for the communications device.

15. The system recited in claim 1, wherein the processor is further configured to:

receive QoS access rules from a service controller, wherein the QoS access rules include a QoS activity map that associates service usage and/or application usage with one or more QoS classes.

16. The system recited in claim 1, wherein the processor is further configured to:

determine if the QoS request is authorized based on verified QoS access rules; and

execute a user interface notification if the QoS request is not authorized, wherein the user notification includes one or more of the following: a denial of the QoS request, information explaining reason(s) for a denial of the QoS request, an option to purchase a new service level for the QoS request, and an option to upgrade to a new service plan.

17. The system recited in claim 1, wherein the processor is further configured to:

facilitate a QoS session if the QoS request is determined to be authorized based on verified QoS access rules.

18. The system recited in claim 1, wherein the processor is further configured to:

facilitate a QoS session if the QoS request is determined to be authorized based on verified QoS access rules; and

periodically verify the QoS session, wherein the QoS session is verified at least in part by comparing one or more device assisted service usage measures with one or more network based service usage measures.

19. The system recited in claim 1, wherein the processor is further configured to:

facilitate a QoS session if the QoS request is determined to be authorized based on verified QoS access rules; and

periodically verify the QoS session, wherein the QoS session is verified at least in part by performing one or more of the following: compare a network based service usage measure with a first service policy associated with the communications device, compare a device assisted service usage measure with the first service policy, compare the network based service usage

measure to the device assisted service usage measure, and perform a test and confirm a device assisted service usage measure based on the test.

20. The system recited in claim 1, wherein the processor is further configured to:

facilitate a QoS session if the QoS request is determined to be authorized based on verified QoS access rules; and

periodically verify the QoS session to verify one or more of the following: the communications device is still authorized to perform the QoS session, the QoS session is communication at an authorized QoS level, and charging is accurate for the QoS session.

21. The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to an access point if the QoS request is determined to be authorized based on verified QoS access rules, wherein the access point facilitates a QoS session for the QoS request based on network capacity.

22. The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to an access point if the QoS request is determined to be authorized based on verified QoS access rules, wherein the access point facilitates a QoS session for the QoS request based on network capacity, wherein the access point includes a base station.

23. The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to a service controller, wherein the service controller coordinates a plurality of QoS requests for a plurality of communications devices in wireless communication with an access point, and wherein the service controller communicates with the access point to facilitate the QoS request for the communications device if the QoS request is determined to be authorized.

24. The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to a service controller, wherein the service controller coordinates a plurality of QoS requests for a plurality of communications devices in wireless communication with one or more base stations, and wherein the service controller communicates with the one or more base stations to determine an available base station based on network capacity to facilitate the QoS request for the communications device if the QoS request is determined to be authorized; and

receive a response to the QoS request, wherein the response includes an indication of which base station is available to facilitate the QoS request.

25. The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to a service controller, wherein the service controller coordinates a plurality of QoS requests for a plurality of communications devices in wireless communication with one or more base stations or other access point, wherein the service controller communicates with the one or more base stations to determine an available base station based on network capacity to facilitate the QoS request for the communications device if the QoS request is determined to be authorized, wherein the other access point includes a WiFi access point; and

receive a response to the QoS request, wherein the response includes an indication of which base station or other access point is available to facilitate the QoS request.

26. The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to a service controller;

receive a QoS approval authorization from the service controller if the QoS request is determined to be authorized and network capacity is determined to be available for the QoS request;

send the QoS request to a base station, wherein the approved QoS request includes the QoS approval authorization for one or more QoS links for a QoS channel.

27. The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to a service controller;

receive a QoS approval authorization from the service controller if the QoS request is determined to be authorized and network capacity is determined to be available for the QoS request, wherein the service controller communicates the QoS approval authorization to a base station;

send the QoS request to the base station to initiate a QoS channel, wherein the QoS channel includes one or more QoS links.

28. The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to a service controller, wherein the service controller communicates with the one or more network devices to provision a QoS channel, wherein the QoS channel includes one or more QoS links; and

the service controller returns a QoS reservation for the provisioned QoS channel.

29. The system recited in claim 1, wherein the processor is further configured to:

send the QoS request to a service controller, wherein the service controller communicates with the one or more network devices to provision a QoS channel through a carrier core network and/or an IPX network, wherein the QoS channel includes one or more QoS links.

30. The system recited in claim 1, wherein the processor is further configured to:

facilitate a QoS session if the QoS request is determined to be authorized; and

determine charging for the QoS session.

31. The system recited in claim 1, wherein the processor is further configured to:

facilitate a plurality of QoS sessions; and

determine charging for each of the plurality of QoS sessions, wherein the charging for each of the plurality of QoS sessions is periodically verified.

32. The system recited in claim 1, wherein the processor is further configured to:

facilitate a plurality of QoS sessions; and

determine charging for each of the plurality of QoS sessions, wherein the charging for each of the plurality of QoS sessions is periodically verified at least in part using network based charging information.

33. The system recited in claim 1, wherein the processor is further configured to:

execute a QoS router for dynamically managing one or more QoS sessions for the communications device.

34. The system recited in claim 1, wherein the processor is further configured to:

execute a QoS router for dynamically managing one or more QoS channels for the communications device; and

send network capacity information to a service controller, wherein the service controller provides a policy decision point for QoS management for a plurality of communications devices in communication with one or more base stations.

35. The system recited in claim 1, wherein the processor is further configured to:

execute a QoS router for dynamically managing one or more QoS channels for the communications device;

send network capacity information to a service controller, wherein the service controller provides a policy decision point for QoS management for a plurality of communications devices in communication with one or more base stations; and

receive QoS router throttling instructions from the service controller, wherein the service controller provides the QoS router throttling instructions to assist in dynamically manage network capacity for the plurality of communications devices in communication with the one or more base stations.

36. The system recited in claim 1, wherein the processor is further configured to:

execute a QoS router for dynamically managing one or more QoS sessions and one or more non-QoS sessions for the communications device, and wherein the QoS router upgrades QoS classes, downgrades QoS classes, deallocates QoS classes, and/or throttles service level usage for one or more QoS and/or non-QoS sessions based on wireless network bandwidth access.

37. The system recited in claim 1, wherein the processor is further configured to:

execute a QoS router for dynamically managing one or more QoS sessions and one or more non-QoS sessions for the communications device, wherein the QoS router upgrades QoS classes, downgrades QoS classes, deallocates QoS classes, and/or throttles service level usage for one or more QoS and/or non-QoS sessions based on wireless network bandwidth access, and wherein the QoS router facilitates one or more of the following: a non-QoS best effort service level, a QoS differentiated service level, and a QoS guaranteed service level.

38. The system recited in claim 1, wherein the processor is further configured to:

facilitate a plurality of QoS sessions using a QoS router, wherein the QoS router allocates an authorized QoS class for each QoS request, and wherein the QoS router periodically modifies the QoS class allocations for one or more QoS sessions and/or throttles non-QoS sessions to facilitate the plurality of QoS sessions; and

determine charging for each of the plurality of QoS sessions, wherein the charging for each of the plurality of QoS sessions is periodically verified.

39. The system recited in claim 1, wherein the processor is further configured to:

receive network capacity information from a base station; and

execute a QoS router for managing one or more QoS sessions for the communications device, wherein the QoS router periodically modifies QoS class allocations for the one or more QoS sessions and/or throttles non-QoS sessions based on the network capacity information.

40. The system recited in claim 1, wherein the processor is further configured to:

receive network capacity information from a base station; and

execute a QoS router for managing one or more QoS sessions for the communications device, wherein the QoS router periodically modifies QoS class allocations for the one or more QoS sessions and/or throttles non-QoS sessions based on the network capacity information; and wherein the QoS router does not downgrade QoS class allocations if the communications device is associated with a service plan that provides for a non-throttled QoS service level.

41. The system recited in claim 1, wherein the processor is further configured to:

executing a QoS router, wherein the user is offered a choice of whether or not to allow the QoS router to dynamically manage QoS and/or non-QoS services.

42. The system recited in claim 1, wherein the processor is further configured to:

determine charging for a QoS session, wherein the charging is determined based on one or more of the following: a QoS class, an allocated network bandwidth, a router queue priority, and per allocated radio access bearer (RAB), and wherein the charging for the QoS session is verified.

43. The system recited in claim 1, wherein the processor is further configured to:

execute a service processor for implementing verified DAS QoS in a secure hardware partition of the processor.

44. The system recited in claim 1, wherein the processor is further configured to:

execute a service processor for implementing verified DAS QoS, wherein the service processor is executed in a kernel of an operating system.

45. The system recited in claim 1, wherein the processor is further configured to:

execute a service processor for implementing verified DAS QoS, wherein the processor is in a secure modem.

46. The system recited in claim 1, wherein the processor is further configured to:

send a QoS request for network resources for an end to end coordinated QoS service channel control for a conversational class session between the communications device and another communications device, wherein the request for network resources is directed to one or more of the following networks: a base station, a transport core network, an IPX network, and a GRX network.

47. A method, comprising:

determining a quality of service (QoS) request for a service over a wireless network; and

verifying the QoS request for the service over the wireless network.

48. A computer program product, the computer program product being embodied in a computer readable storage medium and comprising computer instructions for:

determining a quality of service (QoS) request for a service over a wireless network; and

verifying the QoS request for the service over the wireless network.

49. A system, comprising:

a processor of a network device configured to:

receive a quality of service (QoS) request for a service over a wireless network from one or more communications devices; and

determine if the QoS request for the service over the wireless network is authorized and/or available based on network capacity;

a memory coupled to the processor and configured to provide the processor with instructions.

50. The system recited in claim 49, wherein the processor is further configured to:

setup an end to end coordinated QoS service channel control for a conversational class session between a first communications device and a second communications device.

5

QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES

ABSTRACT OF THE DISCLOSURE

[00157] Quality of Service (QoS) for Device Assisted Services (DAS) are provided. In some embodiments, QoS for DAS includes providing a wireless communications device configures to determine a QoS request for a service over a wireless network; and verify the QoS request for the service over the wireless network using one or more verification techniques.

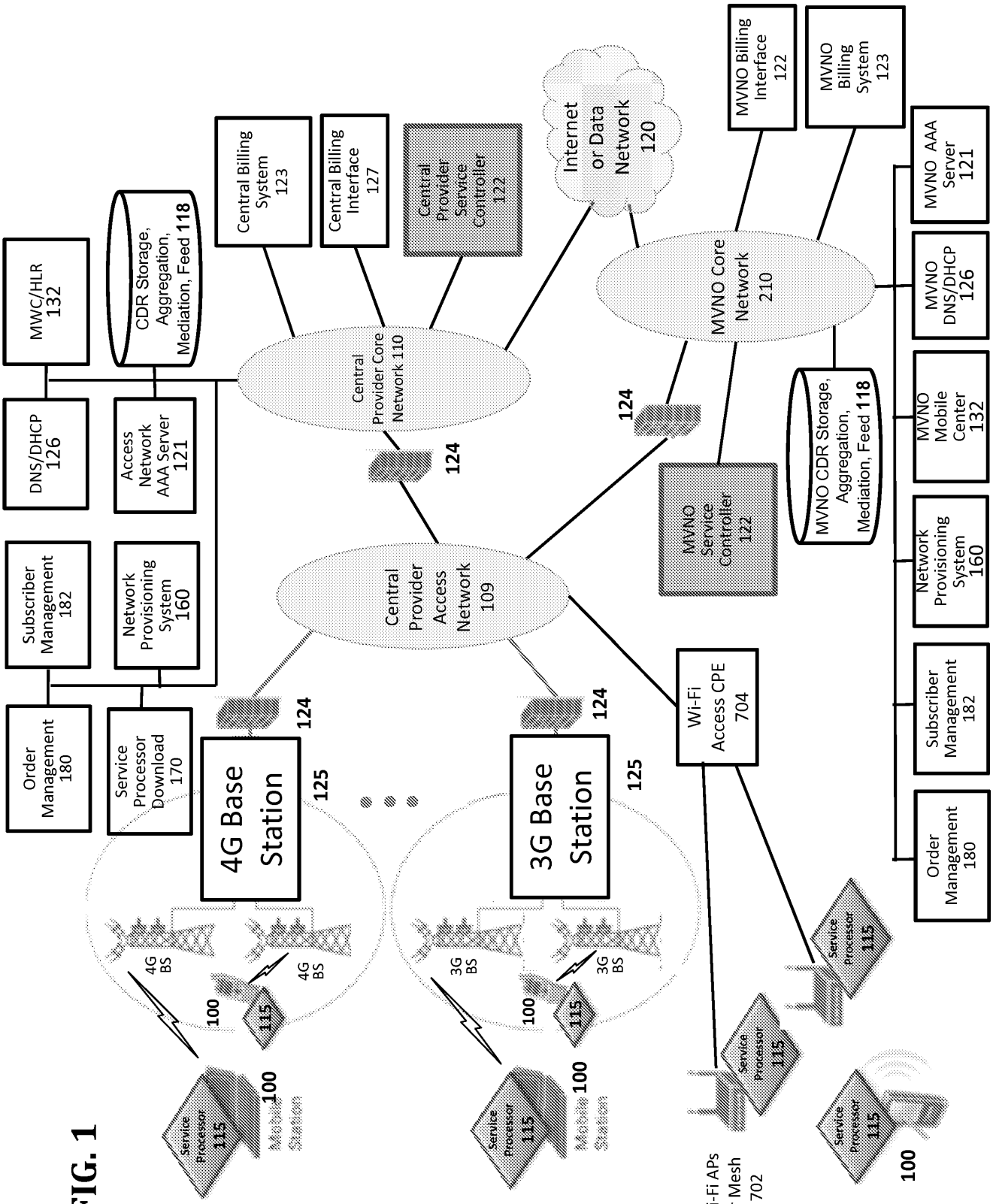

MWC/HLR 132
CDR Storage, Aggregation, Mediation, Feed 118
Central Billing System 123
Central Billing Interface 127
Central Provider Service Controller 122
Internet or Data Network 120
MVNO Billing Interface 122
MVNO Billing System 123
MVNO AAA Server 121
DNS/DHCP 126
Access Network AAA Server 121
Central Provider Core Network 110
MVNO Core Network 210
MVNO DNS/DHCP 126
MVNO CDR Storage, Aggregation, Mediation, Feed 118
MVNO Mobile Center 132
Subscriber Management 182
Network Provisioning System 160
124
MVNO Service Controller 122
Network Provisioning System 160
Central Provider Access Network 109
Order Management 180
Service Processor Download 170
4G Base Station
125
3G Base Station
Wi-Fi Access CPE 704
Subscriber Management 182
Order Management 180
4G BS
3G BS
100
115
Service Processor 115
Mobile Station
Wi-Fi APs or Mesh 702

FIG. 1

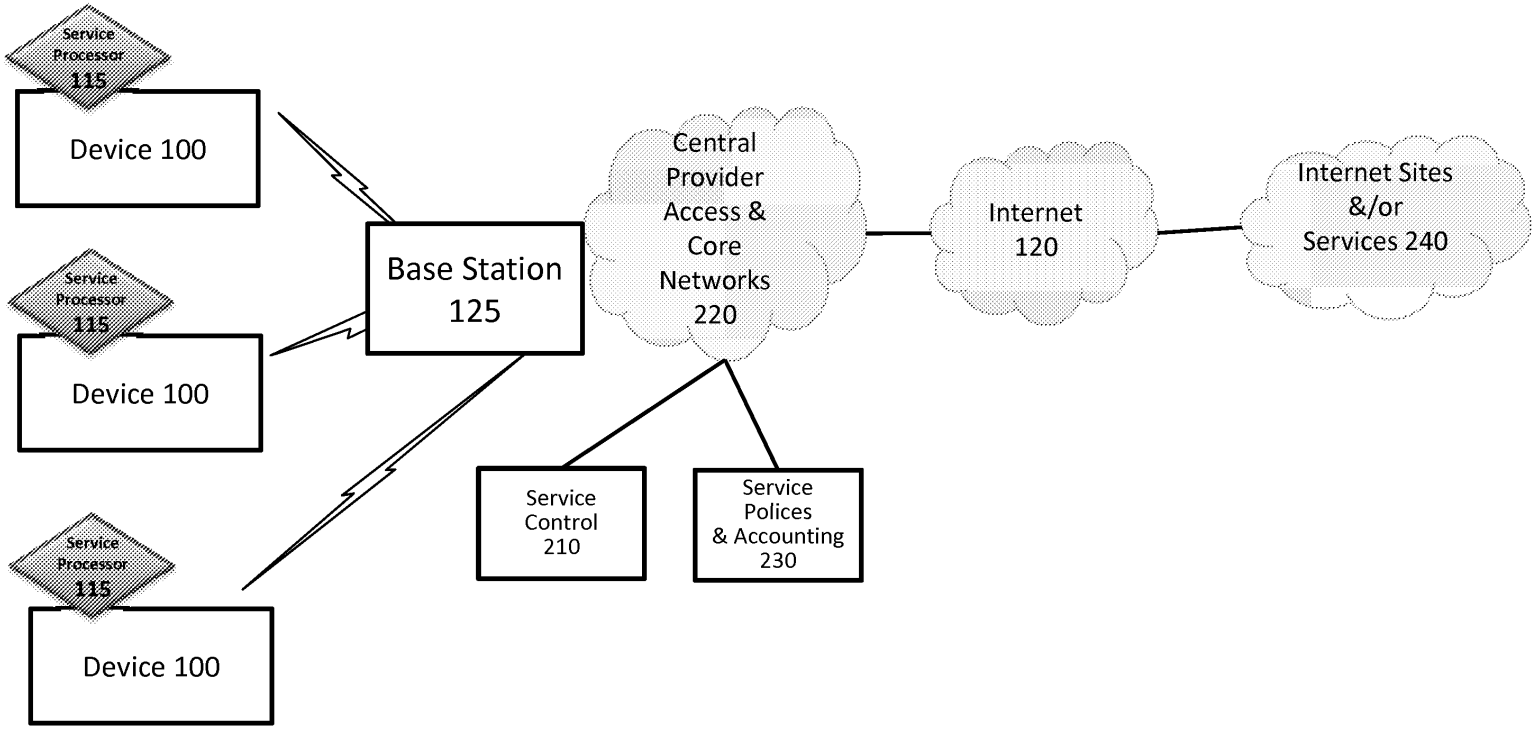

Service Processor 115
Device 100
Service Processor 115
Device 100
Service Processor 115
Device 100
Base Station 125
Central Provider Access & Core Networks 220
Internet 120
Internet Sites &/or Services 240
Service Control 210
Service Polices & Accounting 230

FIG. 2

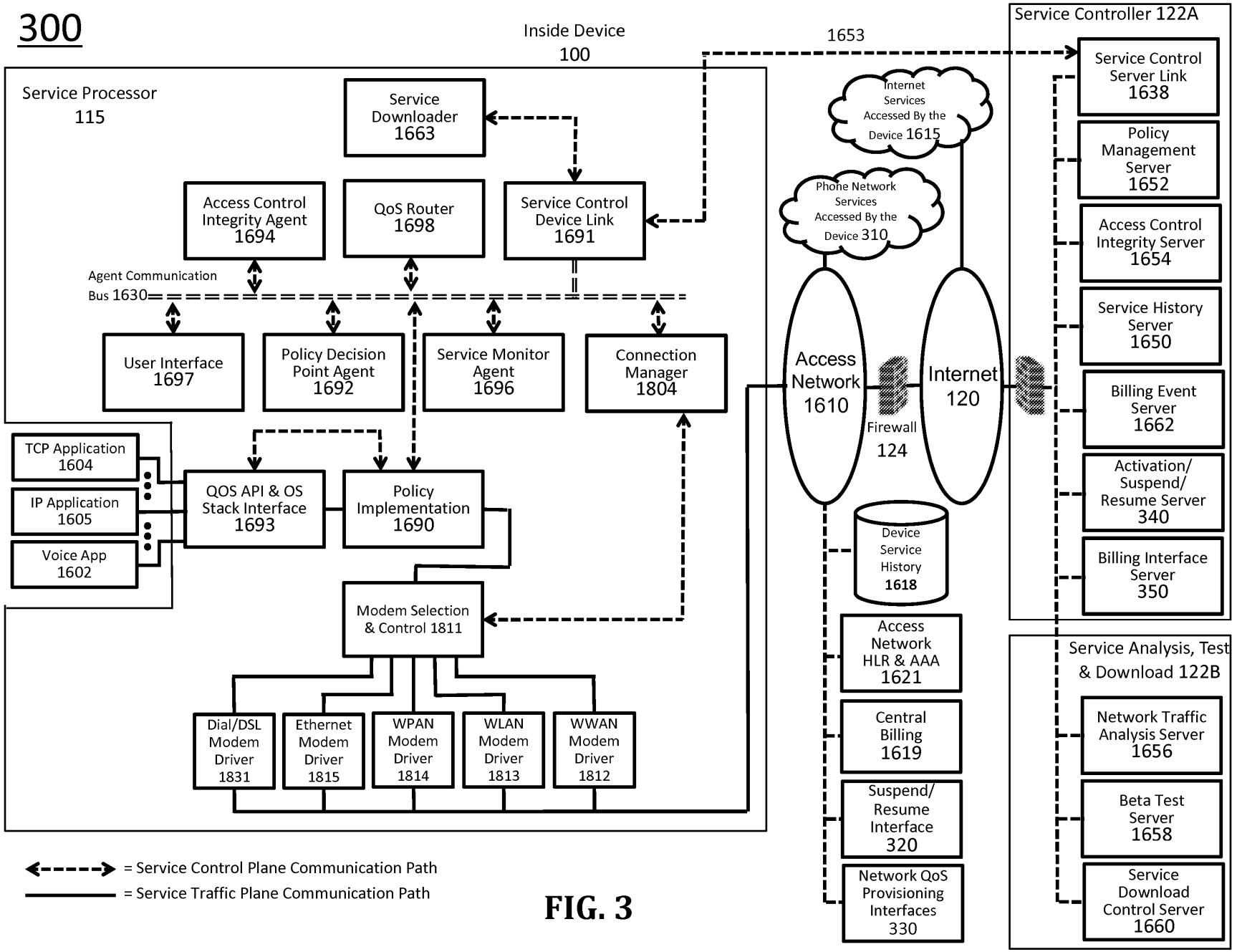

300
Inside Device
100
1653
Service Processor
115
Service Downloader
1663
Access Control Integrity Agent
1694
QoS Router
1698
Service Control Device Link
1691
Agent Communication Bus 1630
User Interface
1697
Policy Decision Point Agent
1692
Service Monitor Agent
1696
Connection Manager
1804
TCP Application
1604
IP Application
1605
Voice App
1602
QOS API & OS Stack Interface
1693
Policy Implementation
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
Phone Network Services Accessed By the Device 310
Access Network
1610
Firewall
124
Internet
120
Device Service History
1618
Access Network HLR & AAA
1621
Central Billing
1619
Suspend/ Resume Interface
320
Network QoS Provisioning Interfaces
330
Service Controller 122A
Service Control Server Link
1638
Policy Management Server
1652
Access Control Integrity Server
1654
Service History Server
1650
Billing Event Server
1662
Activation/ Suspend/ Resume Server
340
Billing Interface Server
350
Service Analysis, Test & Download 122B
Network Traffic Analysis Server
1656
Beta Test Server
1658
Service Download Control Server
1660
= Service Control Plane Communication Path
= Service Traffic Plane Communication Path

FIG. 3

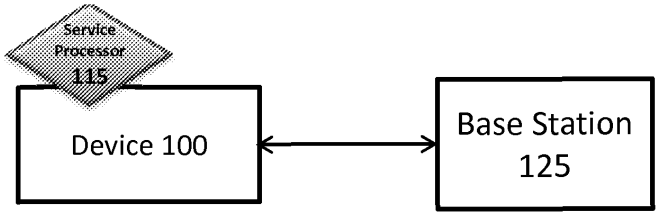


FIG. 4A

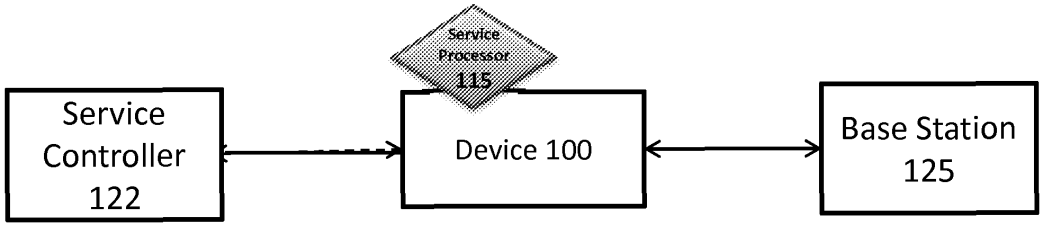


FIG. 4B

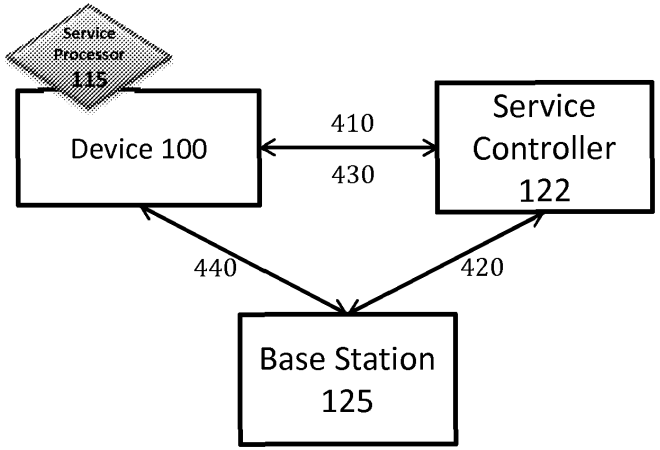


FIG. 4C

FIGs. 4A-4C

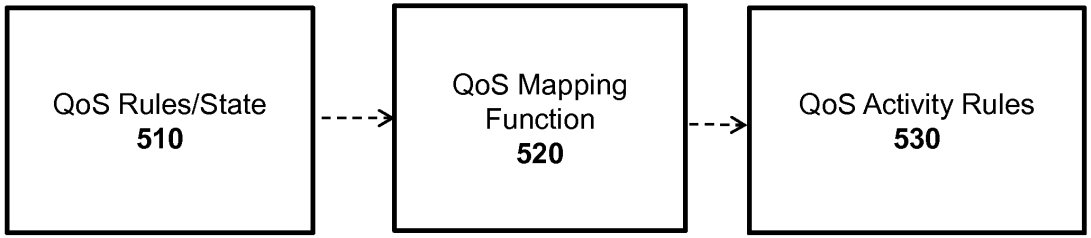

QoS Rules/State
510
QoS Mapping
Function
520
QoS Activity Rules
530

FIG. 5

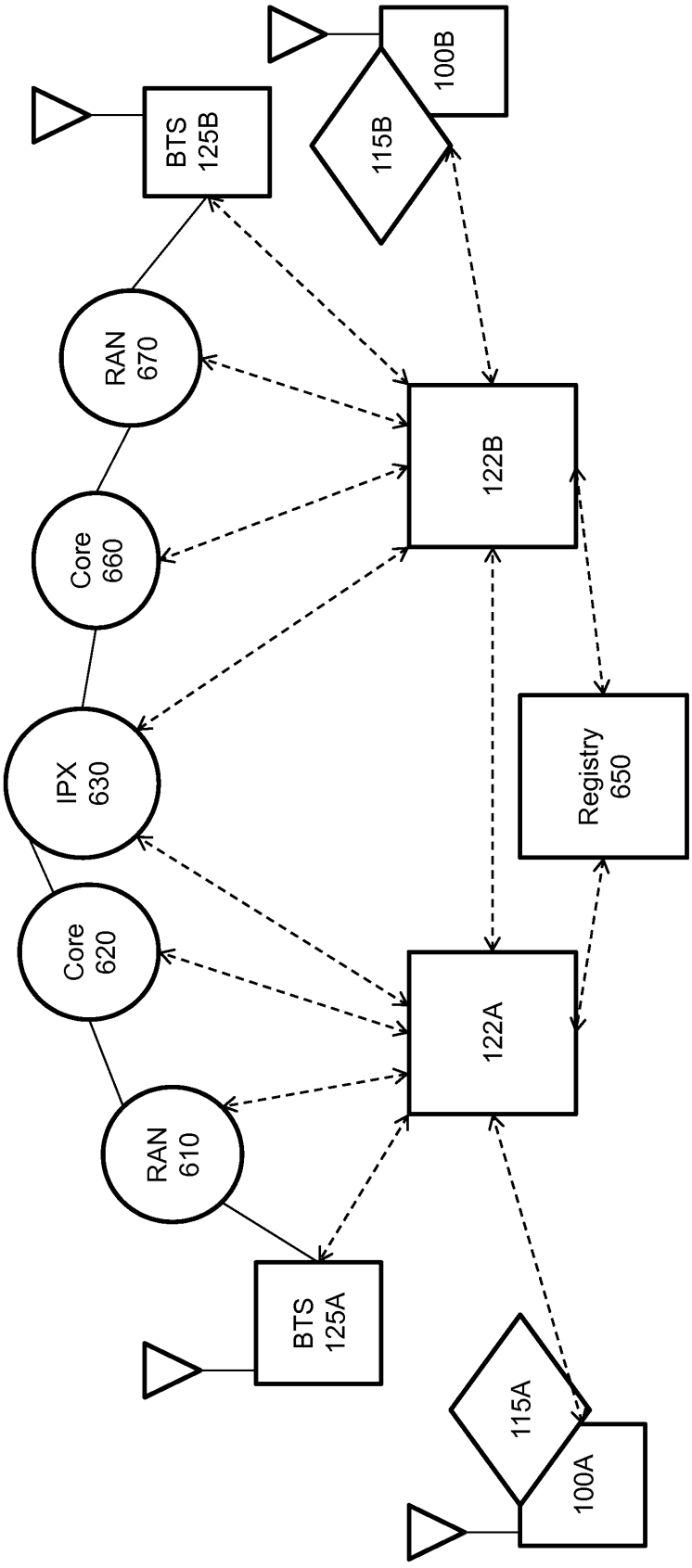

100B
115B
BTS 125B
RAN 670
Core 660
IPX 630
Core 620
RAN 610
BTS 125A
115A
100A
122B
122A
Registry 650

FIG. 6

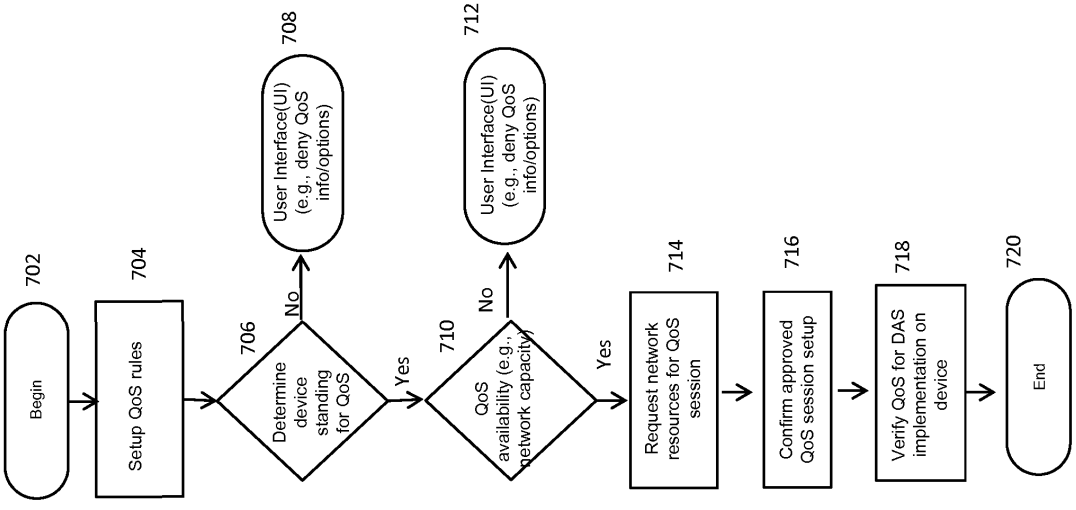

Begin
702
Setup QoS rules
704
Determine device standing for QoS
706
No
User Interface(UI) (e.g., deny QoS info/options)
708
Yes
QoS availability (e.g., network capacity)
710
No
User Interface(UI) (e.g., deny QoS info/options)
712
Yes
Request network resources for QoS session
714
Confirm approved QoS session setup
716
Verify QoS for DAS implementation on device
718
End
720

FIG. 7

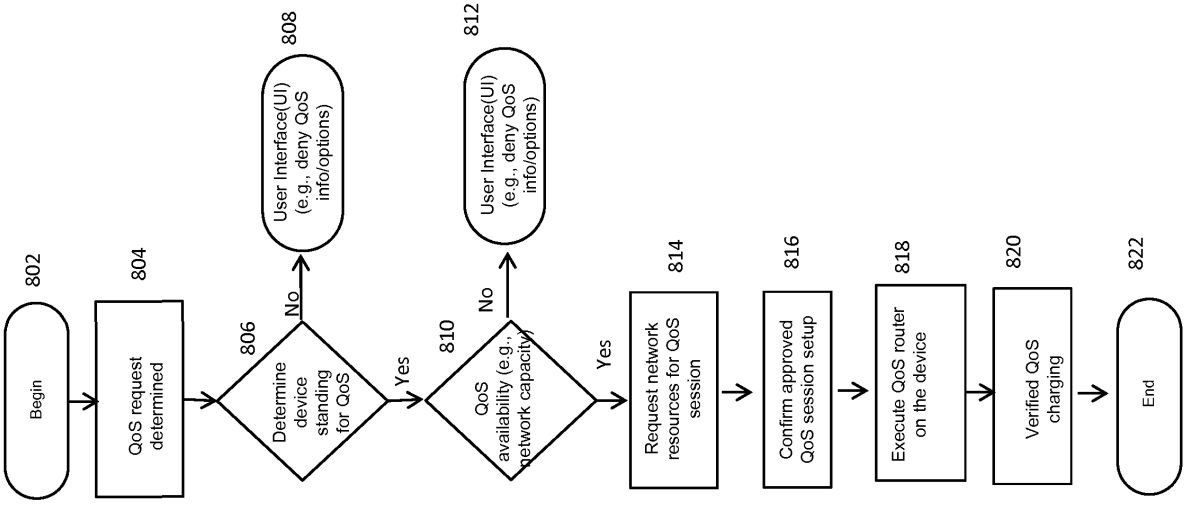

802
Begin
804
QoS request determined
806
Determine device standing for QoS
No
808
User Interface(UI) (e.g., deny QoS info/options)
Yes
810
QoS availability (e.g., network capacity)
No
812
User Interface(UI) (e.g., deny QoS info/options)
Yes
814
Request network resources for QoS session
816
Confirm approved QoS session setup
818
Execute QoS router on the device
820
Verified QoS charging
822
End

FIG. 8A

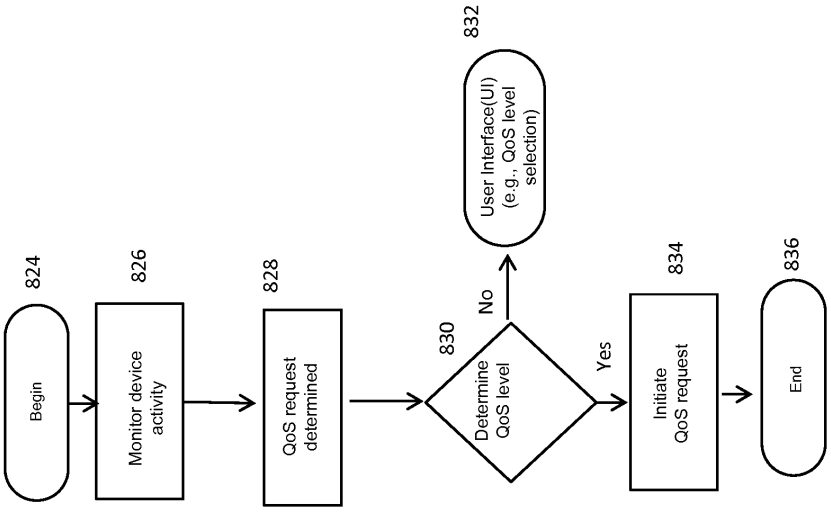

824
Begin
826
Monitor device activity
828
QoS request determined
830
Determine QoS level
No
832
User Interface(UI) (e.g., QoS level selection)
Yes
834
Initiate QoS request
836
End

FIG. 8B

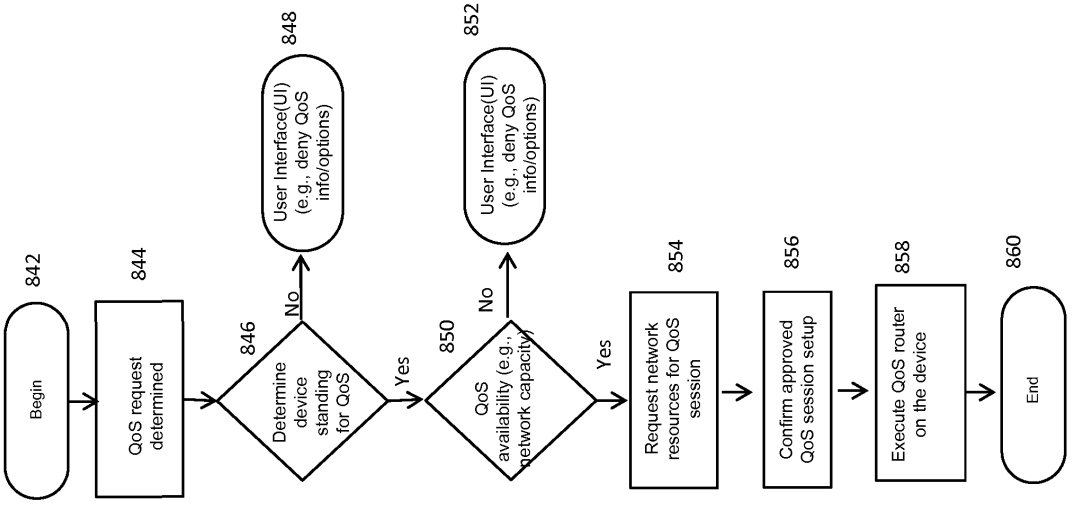

842
Begin
844
QoS request determined
846
Determine device standing for QoS
No
848
User Interface(UI) (e.g., deny QoS info/options)
Yes
850
QoS availability (e.g., network capacity)
No
852
User Interface(UI) (e.g., deny QoS info/options)
Yes
854
Request network resources for QoS session
856
Confirm approved QoS session setup
858
Execute QoS router on the device
860
End

FIG. 8C

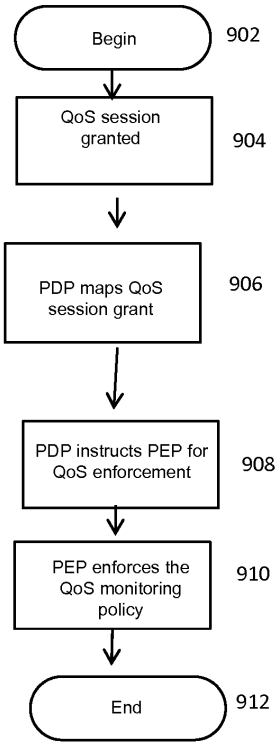

Begin
902
QoS session granted
904
PDP maps QoS session grant
906
PDP instructs PEP for QoS enforcement
908
PEP enforces the QoS monitoring policy
910
End
912

FIG. 9

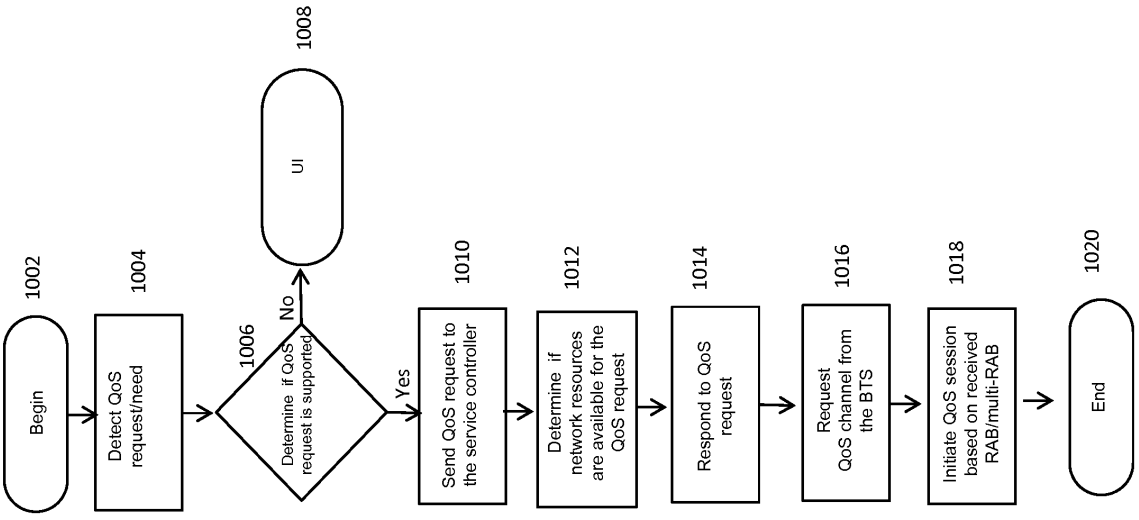

1002
Begin
1004
Detect QoS request/need
1006
Determine if QoS request is supported
No
1008
UI
Yes
1010
Send QoS request to the service controller
1012
Determine if network resources are available for the QoS request
1014
Respond to QoS request
1016
Request QoS channel from the BTS
1018
Initiate QoS session based on received RAB/multi-RAB
1020
End

FIG. 10

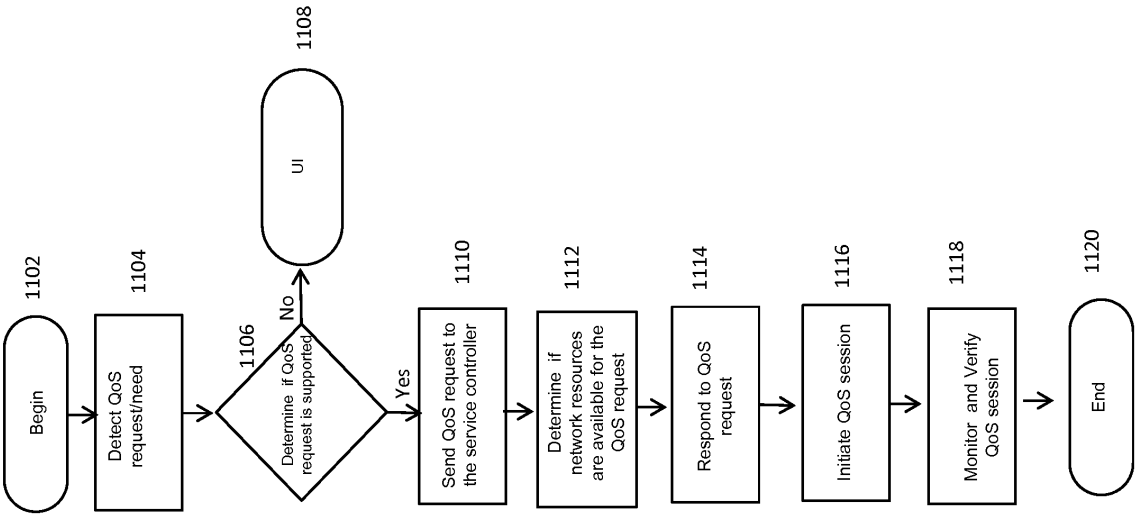

1102
Begin
1104
Detect QoS request/need
1106
Determine if QoS request is supported
No
1108
UI
Yes
1110
Send QoS request to the service controller
1112
Determine if network resources are available for the QoS request
1114
Respond to QoS request
1116
Initiate QoS session
1118
Monitor and Verify QoS session
1120
End

FIG. 11

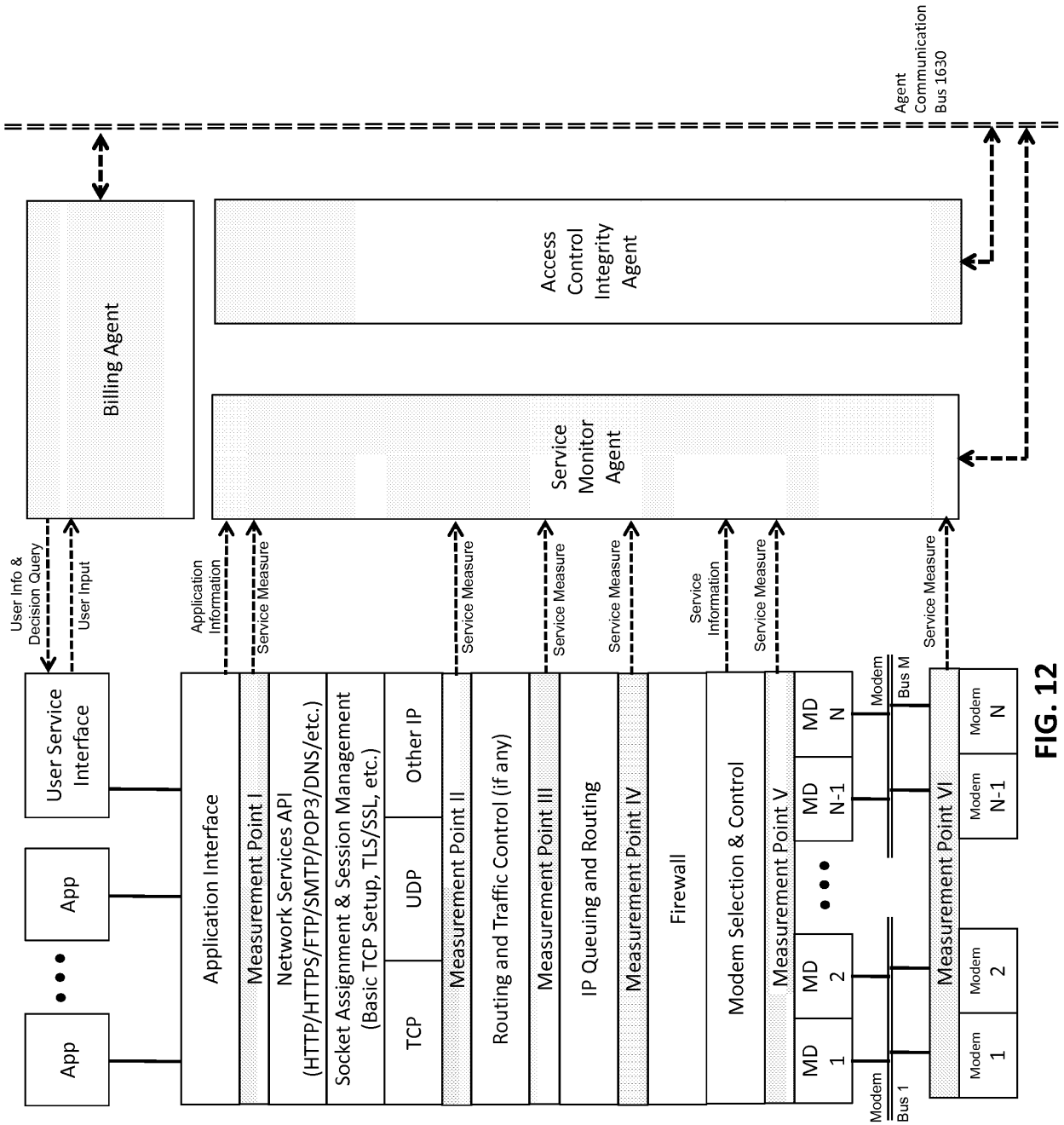

Agent Communication Bus 1630
Billing Agent
Access Control Integrity Agent
Service Monitor Agent
User Info & Decision Query
User Input
Application Information
Service Measure
Service Information
App
User Service Interface
Application Interface
Measurement Point I
Network Services API (HTTP/HTTPS/FTP/SMTP/POP3/DNS/etc.)
Socket Assignment & Session Management (Basic TCP Setup, TLS/SSL, etc.)
TCP
UDP
Other IP
Measurement Point II
Routing and Traffic Control (if any)
Measurement Point III
IP Queuing and Routing
Measurement Point IV
Firewall
Modem Selection & Control
Measurement Point V
MD 1
MD 2
MD N-1
MD N
Modem Bus 1
Modem Bus M
Measurement Point VI
Modem 1
Modem 2
Modem N-1
Modem N

FIG. 12

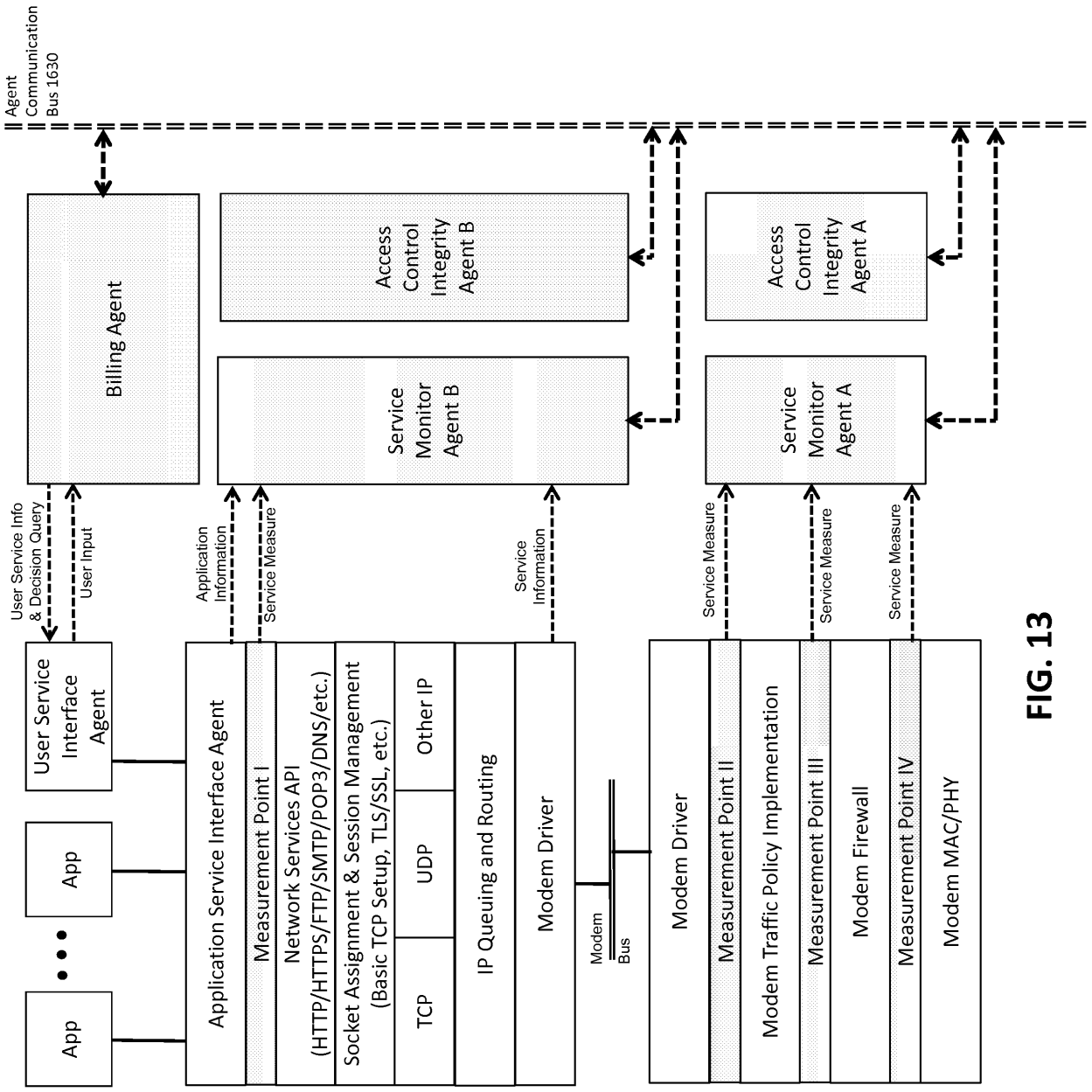

Agent Communication Bus 1630
Billing Agent
Access Control Integrity Agent B
Access Control Integrity Agent A
Service Monitor Agent B
Service Monitor Agent A
User Service Info & Decision Query
User Input
Application Information
Service Measure
Service Information
Service Measure
Service Measure
Service Measure
User Service Interface Agent
App
App
Application Service Interface Agent
Measurement Point I
Network Services API (HTTP/HTTPS/FTP/SMTP/POP3/DNS/etc.)
Socket Assignment & Session Management (Basic TCP Setup, TLS/SSL, etc.)
TCP
UDP
Other IP
IP Queuing and Routing
Modem Driver
Modem Bus
Modem Driver
Measurement Point II
Modem Traffic Policy Implementation
Measurement Point III
Modem Firewall
Measurement Point IV
Modem MAC/PHY

FIG. 13

Electronic Acknowledgement Receipt	
EFS ID:	6893358
Application Number:	12695021
International Application Number:	
Confirmation Number:	7079
Title of Invention:	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES
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:	RALEP029
Receipt Date:	27-JAN-2010
Filing Date:	
Time Stamp:	18:38:50
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	Application Data Sheet	RALEP029_Application_Data_Sheet_sb0014_fill.pdf	965034 3624716292731bdda8f6e8cc01b13c9d895968a3	no	5

Warnings:
Information:

2		RALEP029_APP.pdf	294500 84499a7873e096eede2ab67c3abe1fb9f5bb7486	yes	84

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Transmittal of New Application	1	1
Specification	2	73
Claims	74	83
Abstract	84	84

Warnings:

Information:

3	Drawings-only black and white line drawings	RALEP029_Figures.pdf	825408 49baf2dc612cdff67e85cd9f344c4902df9ea6448	no	15

Warnings:

Information:

Total Files Size (in bytes):	2084942

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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/14 (07-07)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP029
	Application Number	
Title of Invention	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES	

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

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	21912		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES		
Attorney Docket Number	RALEP029	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	15	Suggested Figure for Publication (if any)	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP029
	Application Number	
Title of Invention	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES	

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.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	21912		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

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)
	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
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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP029
	Application Number	
Title of Invention	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES	

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61252151	2009-10-15
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	non provisional of	61252153	2009-10-15

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			(•) Yes ( ) No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

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. [X]

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.

Signature	/Michael J. Schallop/			Date (YYYY-MM-DD)	2010-01-27
First Name	Michael	Last Name	Schallop	Registration Number	44319

EFS Web 2.2.2

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP029
	Application Number	
Title of Invention	QUALITY OF SERVICE FOR DEVICE ASSISTED SERVICES	

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.**

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 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.

SCORE Placeholder Sheet for IFW Content

Application Number: 12695021 Document Date: 1/27/2010

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: **01/27/10**

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PATENT APPLICATION FEE DETERMINATION RECORD
Substitute for Form PTO-875

Application or Docket Number: 12/695,021

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))	50 minus 20 =	30	x$26		OR	x$52	1560
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1	x$110			x$220	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	
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2870

APPLICATION AS AMENDED – PART II

AMENDMENT A		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDI-TIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDI-TIONAL FEE ($)
	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))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

AMENDMENT B		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDI-TIONAL FEE ($)	OR	RATE ($)	ADDI-TIONAL FEE ($)
	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))					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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