INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	27	Droid Wall 1.3.7 description 20100428 obtained from https://www.freewarelovers.com/android/apps/droid-wall	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N/

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	50	NILSSON et al., "A Novel MAC Scheme for Solving the QoS Parameter Adjustment Problem in IEEE802.11e EDCA," February 2006

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EXAMINER SIGNATURE

Examiner Signature	/NAZIA NAOREEN/	Date Considered	01/24/2024

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	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

CERTIFICATION STATEMENT

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

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☐ 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	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
Name/Print	James E. Harris	Registration Number	40013

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.**

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	3687
	Examiner Name	
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	9137744	B2	2015-09-15	Scherzer, et al	
	2	8565766	B2	2013-10-22	Scherzer, et al	
	3					
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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
	1	20040098610	A1	2004-05-20	Hrastar	
	2	20070259673	A1	2007-11-08	Willars et al.	
	3	20080162637	A1	2008-07-03	Adamczyk et al.	

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	First Named Inventor	RALEIGH, GREGORY
	Art Unit	3687
	Examiner Name	
	Attorney Docket Number	RALEP037D1C1C1C1C1

	4	20080318547	A1	2008-12-25	Ballou JR. et al.	
	5	20090257379	A1	2009-10-15	Robinson et al.	
	6	20100082431	A1	2010-04-01	Ramer et al.	
	7	20180262947	A1	2018-09-13	Raleigh et al.	
	8	20140080539	A1	2015-09-15	Scherzer, et al	

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	1	101911772	CN	A	2010-12-08	Evans, G		☐
	2	101114878	CN	A	2008-01-13	Brima I		☐

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	First Named Inventor	RALEIGH, GREGORY
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Examiner Signature	/NAZIA NAOREEN/	Date Considered	01/24/2024

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☐ A certification statement is not submitted herewith.

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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	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-05-23
Name/Print	Farshad Farjami	Registration Number	41014

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.**

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	14	(H04W76/12 AND H04L12/1457 AND H04L12/4633 AND H04L41/0823 AND H04L67/34 AND H04M15/8033).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 03:54 PM
L2	193591	(H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 03:59 PM
L3	0	trigger condition (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 03:59 PM
L4	1616	trigger condition AND (H04W76/12 OR H04L12/1457 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	ADJ	ON	ON	2024/01/04 03:59 PM

		H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc.	CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L5	384	network access AND trigger condition AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 03:59 PM
L6	43	service design center AND trigger condition AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:06 PM
L7	421	network element AND trigger condition AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK,	ADJ	ON	ON	2024/01/04 04:09 PM

			TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L8	79	network element AND trigger condition SAME notification AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:10 PM
L9	5	network element AND trigger condition SAME notification AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:11 PM
L10	84	trigger condition AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:12 PM
L11	1	trigger condition AND cable SAME dsl AND (H04W76/12 OR H04L12/1457 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU,	ADJ	ON	ON	2024/01/04 04:12 PM

		H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L12	135	trigger condition AND cable SAME dsl AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:13 PM
L13	9	trigger condition SAME notification AND cable SAME dsl AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:13 PM
L14	1	trigger condition SAME notification AND design center AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN,	ADJ	ON	ON	2024/01/04 04:14 PM

			WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L15	6	trigger condition AND design center AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:14 PM
L16	795	trigger condition AND network element AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:27 PM
L17	0	trigger condition AND network element SAME monitor$3 NEAR service usage AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:33 PM
L18	0	trigger condition AND monitor$3 NEAR service usage AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	ADJ	ON	ON	2024/01/04 04:33 PM

			EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L19	0	trigger condition SAME notification SAME policy AND monitor$3 NEAR service usage AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:34 PM
L20	2	trigger condition SAME notification SAME policy AND monitor$3 near5 service AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:34 PM
L21	0	trigger condition SAME network access near5 activity AND monitor$3 near5 service AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO;	ADJ	ON	ON	2024/01/04 04:44 PM

			JPO; DERWENT; IBM_TDB)				
L22	0	trigger condition SAME network access near5 activity AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:44 PM
L23	0	trigger condition SAME network access near5 activit$3 AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:45 PM
L24	13000	trigger condition AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:45 PM
L25	130	trigger condition SAME network access AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	ADJ	ON	ON	2024/01/04 04:45 PM

			HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L26	3	trigger condition SAME network access SAME activit$3 AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:45 PM
L27	6	network near5 provision$3 SAME service usage SAME activit$3 AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:53 PM
L28	113	network near5 provision$3 SAME service usage AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT;	ADJ	ON	ON	2024/01/04 04:53 PM

			IBM_TDB)				
L29	45	network near5 provision$3 SAME service usage AND trigger AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:54 PM
L30	295	trigger AND network near5 provision$3 AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:56 PM
L31	126	trigger SAME (message OR notification) AND network near5 provision$3 AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 04:57 PM
L32	21	network access SAME service SAME notification SAME messages AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS,	ADJ	ON	ON	2024/01/04 05:18 PM

		H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L33	690	network access SAME service SAME notification SAME messages AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:18 PM
L34	253	network access SAME service SAME notification SAME messages AND provision$3 AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:18 PM
L35	116	network access SAME service SAME notification SAME messages AND provision$3 AND trigger AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:19 PM

L36	82	network access SAME service SAME notification SAME messages AND provision$3 AND trigger AND instructions AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:19 PM
L37	0	network access SAME service SAME notification SAME messages AND provision$3 AND trigger AND identification instructions AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:19 PM
L38	0	network access SAME service SAME notification SAME messages AND provision$3 AND trigger AND identification abd translator AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:20 PM
L39	22	network access SAME service SAME notification SAME messages AND provision$3 AND trigger AND identification AND translator AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL,	ADJ	ON	ON	2024/01/04 05:20 PM

			NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L40	61	network access SAME service SAME notification SAME messages AND provision$3 AND trigger AND policy AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:20 PM
L41	2364	provision$3 AND trigger AND policy AND network element AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:21 PM
L42	177	provision$3 AND trigger AND policy AND network access SAME notification AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:21 PM
L43	10	provision$3 AND trigger	(US-PGPUB; USPAT;	ADJ	ON	ON	2024/01/04

		AND policy AND network access SAME notification SAME user device AND @py<"2009"	USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				05:21 PM
L44	1	provision$3 AND trigger AND policy AND network access AND service design center AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:22 PM
L45	3	provision$3 AND trigger AND policy AND network access AND design center AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:22 PM
L46	0	provision$3 AND trigger AND policy AND network access SAME serivce usage AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL,	ADJ	ON	ON	2024/01/04 05:23 PM

			PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L47	28	provision$3 AND trigger AND policy AND network access SAME service usage AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:23 PM
L48	431	provision$3 AND trigger AND policy AND network access AND cable SAME dsl AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:24 PM
L49	23	provision$3 AND trigger SAME policy SAME notification AND network access AND cable SAME dsl AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/04 05:24 PM
L51	0	network access near5 end user near5 activity	(US-PGPUB; USPAT; USOCR; FIT (AP, AT,	ADJ	ON	ON	2024/01/12 07:54 PM

		AND trigger AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L52	0	network access near5 user near5 activity AND trigger AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/12 07:54 PM
L53	0	network access near5 user near5 activity AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/12 07:55 PM
L54	2468	network access AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE,	ADJ	ON	ON	2024/01/12 07:55 PM

			SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L55	38	network access SAME notification AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc. AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/12 07:55 PM
L56	154	network element AND network access SAME notification AND trigger AND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/12 08:01 PM
L57	561	network element AND network access SAME notification AND trigger AND design centerAND @py<"2009"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/12 08:01 PM
L58	0	network element AND network access SAME notification AND trigger	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY,	ADJ	ON	ON	2024/01/12 08:01 PM

		AND design center AND @py<"2009"	CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L60	2	("9288276").pn.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/13 12:14 AM
L62	14	(network access notification).clm. AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/24 09:58 PM
L63	24	network access notification AND (H04W76/12 OR H04L12/1457 OR H04L12/4633 OR H04L41/0823 OR H04L67/34 OR H04M15/8033).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH,	ADJ	ON	ON	2024/01/24 09:59 PM

			TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L64	1121	((("RALEIGH") near3 ("Gregory")) OR (("RAISSINIA") near3 ("Alireza")) OR (("GREEN") near3 ("Jeffrey"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	ADJ	ON	ON	2024/01/24 10:03 PM
L65	99	((("HEADWATER") near3 ("RESEARCH") near3 ("LLC"))).AS,AANM.	(USPAT)	ADJ	ON	ON	2024/01/24 10:12 PM
L66	199	L64 AND L65	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	ADJ	ON	ON	2024/01/24 10:12 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Web Search History

date, time	web site	search string
1/24/2024 4:14:15 PM	Google Scholar	network access service notification messages and end user device
1/24/2024 4:19:45 PM	Google Scholar	service design center and notification and policy and trigger
1/24/2024 4:26:36 PM	Google Scholar	network provisioning instruction translator and trigger identification
1/24/2024 4:31:28 PM	Google Scholar	network provisioning system and element and monitoring service usage
1/24/2024 4:36:57 PM	Google Scholar	network element and monitor and service usage and trigger condition

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

PTO/SB/08a (01-22)
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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	17567594
Filing Date	2022-01-03
First Named Inventor	RALEIGH, GREGORY
Art Unit	
Examiner Name	not yet assigned
Attorney Docket Number	RALEP037D1C1C1C1C1

U.S.PATENTS Remove

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	7526541	B2	2009-04-28	Roese et al.	
	2	7529204	B2	2009-05-05	Bourlas, Yair et al.	
	3	7533158	B2	2009-05-12	Grannan et al.	
	4	7535880		2009-05-19	Hinman, Brian L. et al.	
	5	7536695	B2	2009-05-19	Alam et al.	
	6	7539132	B2	2009-05-26	Werner et al.	
	7	7539862	B2	2009-05-26	Edgett et al.	
	8	7540408	B2	2009-06-02	Levine et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N/

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	9	7545782		2009-06-09	Rayment, Stephen G. et al.	
	10	7546460		2009-06-09	Maes, Stephane H.	
	11	7546629		2009-06-09	ALBERT, Anthony et al.	
	12	7548875	B2	2009-06-16	Mikkelsen et al.	
	13	7548976	B2	2009-06-16	Bahl, Paramvir et al.	
	14	7551921	B2	2009-06-23	Petermann	
	15	7551922		2009-06-23	Roskowski, Steve et al.	
	16	7554983	B1	2009-06-30	Muppala, Suresh	
	17	7555757	B2	2009-06-30	Smith et al.	
	18	7561899	B2	2009-07-14	Lee, Changseok	
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	20	7564799	B2	2009-07-21	Holland et al.	
	21	7565141		2009-07-21	Macaluso, Anthony G.	
	22	7565328	B1	2009-07-21	Donner	
	23	7574509	B2	2009-08-11	Nixon et al.	
	24	7574731		2009-08-11	FASCENDA, Anthony C.	
	25	7577431	B2	2009-08-18	Jiang, Yue Jun	
	26	7580356	B1	2009-08-25	Mishra et al.	
	27	7580857		2009-08-25	VanFLEET et al.	
	28	7583964	B2	2009-09-01	Wong, Gregory A.	
	29	7584298	B2	2009-09-01	Klinker et al.	
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	31	7586871	B2	2009-09-08	Hamilton et al.	
	32	7593417		2009-09-22	Wang, James et al.	
	33	7593730	B2	2009-09-22	Khandelwal, Deepak et al.	
	34	7596373	B2	2009-09-29	Mcgregor, Christopher et al.	
	35	7599288		2009-10-06	COLE, Raymond E. et al.	
	36	7599714	B2	2009-10-06	Kuzminskiy, Alexandr	
	37	7602746	B2	2009-10-13	Calhoun et al.	
	38	7603710	B2	2009-10-13	Harvey et al.	
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	42	7609650		2009-10-27	ROSKOWSKI, Steve et al.	
	43	7609700		2009-10-27	Ying, Wen-Ping et al.	
	44	7610047	B2	2009-10-27	Hicks III et al.	
	45	7610057	B2	2009-10-27	Bahl et al.	
	46	7610328		2009-10-27	HAASE et al.	
	47	7610396	B2	2009-10-27	Taglienti et al.	
	48	7612712	B2	2009-11-03	LaMance et al.	
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	50	7614051	B	2009-11-03	Glaum et al.	
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	53	7620041		2009-11-17	Dunn, Jeffrey H. et al.	
	54	7620065		2009-11-17	FALARDEAU, Eric	
	55	7620162		2009-11-17	AARON et al.	
	56	7620383	B2	2009-11-17	Taglienti et al.	
	57	7627314		2009-12-01	Carlson, Steven I. et al.	
	58	7627600	B2	2009-12-01	Citron et al.	
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	61	7633438		2009-12-15	Tysowski, Piotr Konrad	
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	64	7636574		2009-12-22	Poosala, Viswanath	
	65	7636626	B2	2009-12-22	Oesterling et al.	
	66	7643411	B2	2010-01-05	Andreasen et al.	
	67	7644151		2010-01-05	JERRIM, John et al.	
	68	7644267		2010-01-05	YLIKOSKI, Martti et al.	
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	72	7653394	B2	2010-01-26	McMillin, Brian K.	
	73	7656271	B2	2010-02-02	Ehrman et al.	
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	75	7660419	B1	2010-02-09	Ho, Jin-Meng	
	76	7661124	B2	2010-02-09	Ramanathan et al.	
	77	7664494	B2	2010-02-16	Jiang, Yue Jun	
	78	7668176		2010-02-23	Chuah, Mooi Choo	
	79	7668612	B	2010-02-23	Okkonen, Harri	
	80	7668903		2010-02-23	EDWARDS et al.	
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	84	7681226	B2	2010-03-16	Kraemer et al.	
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	88	7685530	B2	2010-03-23	Sherrard et al.	
	89	7688792	B2	2010-03-30	Babbar et al.	
	90	7693107	B2	2010-04-06	De Froment, Eric	
	91	7693720		2010-04-06	KENNEWICK et al.	
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	96	7719966	B2	2010-05-18	Luft et al.	

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	97	7720206	B2	2010-05-18	Devolites et al.	
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	99	7720505		2010-05-18	GOPI et al.	
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	101	7721296	B2	2010-05-18	Ricagni, Giuseppe	
	102	7724716	B2	2010-05-25	Fadell, Anthony M.	
	103	7725570		2010-05-25	Lewis, Lundy	
	104	7729326		2010-06-01	Sekhar, Ramesh	
	105	7730123		2010-06-01	ERICKSON, Richard R. et al.	
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	110	7746854		2010-06-29	AMBE, Shekhar et al.	
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	112	7747699		2010-06-29	PRUEITT et al.	
	113	7747730		2010-06-29	HARLOW, James D.	
	114	7752330	B2	2010-07-06	Olsen et al.	
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	116	7756509	B2	2010-07-13	Rajagopalan et al.	
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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).

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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.

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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	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
Name/Print	James E. Harris	Registration Number	40013

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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).

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.

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Bibliographic Data

Application No: 17/567,594

Foreign Priority claimed: ○ Yes ◉ No

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Verified and Acknowledged: /NAZIA NAOREEN/ (Examiner's Signature) | (Initials)

Title: Enterprise Access Control and Accounting Allocation for Access Networks

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
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CONTINUING DATA

This application is a CON of 16740625 01/13/2020 PAT 11219074

16740625 is a CON of 16132643 09/17/2018 PAT 10536983

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FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

01/13/2022

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$1,020

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First Named Inventor	RALEIGH, GREGORY
Art Unit	
Examiner Name	not yet assigned
Attorney Docket Number	RALEP037D1C1C1C1C1

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	Attorney Docket Number	RALEP037D1C1C1C1C1

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	192	9032427	B2	2015-05-12	Gallant et al.	
	193	9049010		2015-06-02	Jueneman et al.	
	194	9064275	B1	2015-06-23	Lu et al.	
	195	9105031	B2	2015-08-11	Shen et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	196	9106414	B2	2015-08-11	Laves	
	197	9107053	B2	2015-08-11	Davis et al.	
	198	9111088	B2	2015-08-18	Ghai et al.	
	199	9135037	B1	2015-09-15	Petrescu-Prahova et al.	
	200	9137286	B1	2015-09-15	Yuan	
	201	9143933	B2	2015-09-22	Ikeda et al.	
	202	9158579	B1	2015-10-13	Robles	
	203	9172553	B2	2015-10-27	Dawes et al.	
	204	9173090	B2	2015-10-27	Tuchman et al.	
	205	9177455	B2	2015-11-03	Remer, David M.	
	206	9183524	B2	2015-11-10	Carter	

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	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	207	9204282	B2	2015-12-01	Raleigh	
	208	9225847	B2	2015-12-29	Daymond et al.	
	209	9252977	B2	2016-02-02	Levi et al.	
	210	9262370	B2	2016-02-16	Hofstaedter et al.	
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	212	9277433	B2	2016-03-01	Raleigh et al.	
	213	9282460	B2	2016-03-08	Souissi, Slim Salah	
	214	9286469	B2	2016-03-15	Kraemer et al.	
	215	9286604	B2	2016-03-15	Aabye et al.	
	216	9288276	B2	2016-03-15	Adamczyk et al.	
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	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	218	9325737	B2	2016-04-26	Gutowski et al.	
	219	9326173	B2	2016-04-26	Luft, Achim	
	220	9344557	B2	2016-05-17	Gruchala et al.	
	221	9350842	B2	2016-05-24	Swanburg et al.	
	222	9363285	B2	2016-06-07	Kitamura	
	223	9367680	B2	2016-06-14	Mahaffey et al.	
	224	9402254	B2	2016-07-26	Kneckt et al.	
	225	9413546	B2	2016-08-09	Meier et al.	
	226	9418381	B2	2016-08-16	Ahuja et al.	
	227	9419867	B2	2016-08-16	Okholm et al.	
	228	9436805	B1	2016-09-06	Kravets	

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	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	229	9438642	B2	2016-09-06	Alberth Jr. et al.	
	230	9479917	B1	2016-10-25	Gota et al.	
	231	9491199	B2	2016-11-08	Raleigh et al.	
	232	9501803	B2	2016-11-22	Bilac et al.	
	233	9516456	B2	2016-12-06	Stephens et al.	
	234	9525992	B2	2016-12-20	Rao et al.	
	235	9534861	B1	2017-01-03	Kellgren	
	236	9544397	B2	2017-01-10	Raleigh et al.	
	237	9557889	B2	2017-01-31	Raleigh et al.	
	238	9560108	B2	2017-01-31	Salkintzis	
	239	9589117	B2	2017-03-07	Ali et al.	

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	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	240	9609459	B2	2017-03-28	Raleigh, Gregory G.	
	241	9609510	B2	2017-03-28	Raleigh et al.	
	242	9609544	B2	2017-03-28	Raleigh et al.	
	243	9615192	B2	2017-04-04	Raleigh	
	244	9634850	B2	2017-04-25	Taft et al.	
	245	9642004	B2	2017-05-02	Wang et al.	
	246	9648022	B2	2017-05-09	Peterka et al.	
	247	9673996	B1	2017-06-06	Upadhyay et al.	
	248	9680658	B2	2017-06-13	Goel et al.	
	249	9681003	B1	2017-06-13	KIM et al.	
	250	9691082	B1	2017-06-27	Burnett et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	251	9712443	B1	2017-07-18	Phaal	
	252	9712476	B2	2017-07-18	Boynton et al.	
	253	9749899	B2	2017-08-29	Raleigh et al.	
	254	9755842	B2	2017-09-05	Raleigh et al.	
	255	9766873	B2	2017-09-19	Steigleder	
	256	9852426	B2	2017-12-26	Bacastow	
	257	9923790	B2	2018-03-20	Patel et al.	
	258	9942796	B2	2018-04-10	Raleigh	
	259	9954975	B2	2018-04-24	Raleigh et al.	
	260	9986413	B2	2018-05-29	Raleigh	
	261	RE44412		2013-08-06	Naqvi et al.	

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Art Unit	
Examiner Name	not yet assigned
Attorney Docket Number	RALEP037D1C1C1C1C1

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	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
Name/Print	James E. Harris	Registration Number	40013

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.**

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

PTO/SB/08a (01-22)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	
	Attorney Docket Number	RALEP037D1C1C1C1C1

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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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	20100199325	A1	2013-03-05	Raleigh	
	2	20040098610	A1	2004-05-20	Hrastar, Scott E.	
If you wish to add additional U.S. Published Application citation information please click the Add button.						

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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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	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	Arai, Masato, et al; "A Proposal for an Effective Information Flow Control Model for Sharing and Protecting Sensitive Information", Proc. 7th Australasian Information Security Conference (AISC 2009), Wellington, New Zealand	☐

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☐ 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	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-11-08
Name/Print	Farshad Farjami	Registration Number	41014

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Searches: 5
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Search #	Timestamp	Results	Page
1	2024-01-24 21:14 UTC	67,716,750	3
2	2024-01-24 21:19 UTC	3,838,793	4
3	2024-01-24 21:26 UTC	328,095	4
4	2024-01-24 21:31 UTC	10,515,529	4
5	2024-01-24 21:37 UTC	73,445,473	4

Content: Patents + NPL (193)

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1 **2024-01-24 21:14 UTC | 67,716,750 results from**

De-Dup: None | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
network access service notification messages and end user device

Concept Modifiers: None

Filters: None

2 **2024-01-24 21:19 UTC | 3,838,793 results from**

De-Dup: None | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
service design center and notification and policy and trigger

Concept Modifiers: None

Filters: None

3 **2024-01-24 21:26 UTC | 328,095 results from**

De-Dup: None | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
network provisioning instruction translator and trigger identification

Concept Modifiers: None

Filters: None

4 **2024-01-24 21:31 UTC | 10,515,529 results from**

De-Dup: None | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
network provisioning system and element and monitoring service usage

Concept Modifiers: None

Filters: None

5 **2024-01-24 21:37 UTC | 73,445,473 results from**

De-Dup: None | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
network element and monitor and service usage and trigger condition

Concept Modifiers: None

Filters: None

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

PTO/SB/08a (01-22)
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(Not for submission under 37 CFR 1.99)

Application Number	17567594
Filing Date	2022-01-03
First Named Inventor	RALEIGH, GREGORY
Art Unit	OPAP
Examiner Name	NOT YET ASSIGNED
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	OPAP
	Examiner Name	NOT YET ASSIGNED
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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).

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The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

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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	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-07-07
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	Attorney Docket Number	RALEP037D1C1C1C1C1

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EXAMINER SIGNATURE

Examiner Signature	/NAZIA NAOREEN/	Date Considered	01/24/2024

*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	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

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).

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☐ 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.

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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	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
Name/Print	James E. Harris	Registration Number	40013

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	First Named Inventor	RALEIGH, GREGORY
	Art Unit	N/A
	Examiner Name	NOT YET ASSIGNED
	Attorney Docket Number	RALEP037D1C1C1C1C1

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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	2	5987611	A	1999-11-16	Freund	
	3	6947723	B1	2005-09-20	Gurnani et al.	
	4	7924730	B1	2011-04-12	McAllister et al.	
	5	9277445	B2	2016-03-01	Raleigh et al.	
	6					
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	Attorney Docket Number	RALEP037D1C1C1C1C1

	1	20050037740	A1	2005-02-17	Smith et al.	
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	6	20080057894	A1	2008-03-06	Aleksic	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	1484871	EP	A1	2004-12-08	Kelz et al.		☐

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NON-PATENT LITERATURE DOCUMENTS

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

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	1	IPR2023-01157: Petition for Inter Partes Review of United States Patent No. 11,405,224, filed July 20, 2023.	☐
	2	IPR2023-01226: Petition for Inter Partes Review of United States Patent No. 10,237,773, filed July 21, 2023.	☐
	3	Complaint filed in Headwater Research LLC v. Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., dated October 26, 2022, Case No. 2:22-cv-00422, E.D. Texas.	☐
	4	First Amended Complaint filed in Headwater Research LLC v. Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., dated November 30, 2022, Case No. 2:22-cv-00422, E.D. Texas.	☐
	5	Complaint filed in Headwater Research LLC v. Samsung Electronics Co., Ltd. et al., dated December 6, 2022, Case No. 2:22-cv-00467, E.D. Texas.	☐
	6	File History of U.S. Patent No. 9,277,445 (Raleigh et al.), issued March 1, 2016	☐
	7	File History of IPR2023-01157, filed July 20, 2023.	☐
	8	File History of IPR2023-01226, filed July 21, 2023.	☐
	9	Samsung Stipulation letter, dated July 21, 2023 in Headwater Research LLC v. Samsung Electronics Co., Ltd., et al. Case No. 2:22-cv-00467, E.D. Texas	☐
	10	Samsung Stipulation letter, dated July 20, 2023 in Headwater Research LLC v. Samsung Electronics Co., Ltd., et al. Case No. 2:22-cv-00422, E.D. Texas	☐
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EXAMINER SIGNATURE			
Examiner Signature	/NAZIA NAOREEN/	Date Considered	01/24/2024

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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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	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-07-26
Name/Print	Farshad Farjami	Registration Number	41014

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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	7526541	B2	2009-04-28	Roese et al.	
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	Attorney Docket Number	RALEP037D1C1C1C1C1

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	12	7548875	B2	2009-06-16	Mikkelsen et al.	
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	Attorney Docket Number	RALEP037D1C1C1C1C1

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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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
Name/Print	James E. Harris	Registration Number	40013

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.**

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Bibliographic Data

Application No: 17/567,594

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /NAZIA NAOREEN/ (Examiner's Signature) | (Initials)

Title: Enterprise Access Control and Accounting Allocation for Access Networks

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/03/2022	709	2458	
RULE			

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CONTINUING DATA

This application is a CON of 16740625 01/13/2020 PAT 11219074

16740625 is a CON of 16132643 09/17/2018 PAT 10536983

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FOREIGN APPLICATIONS

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01/13/2022

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Doc code: IDS
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Examiner Name	not yet assigned
Attorney Docket Number	RALEP037D1C1C1C1C1

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	Attorney Docket Number	RALEP037D1C1C1C1C1

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	159	8856015	B2	2014-10-07	Mesaros	
	160	8862751	B2	2014-10-14	Faccin et al.	
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	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	163	8868727	B2	2014-10-21	Yumerefendi et al.	
	164	8875042	B2	2014-10-28	LeJeune et al.	
	165	8880047	B2	2014-11-04	Konicek et al.	
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	167	8898748	B2	2014-11-25	Burks et al.	
	168	8908516	B2	2014-12-09	Tzamaloukas et al.	
	169	8924469	B2	2014-12-30	Raleigh et al.	
	170	8929374	B2	2015-01-06	Tönsing et al.	
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	173	8943551	B2	2015-01-27	Ganapathy et al.	

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	174	8948198	B2	2015-02-03	Nee et al.	
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	185	9008653	B2	2015-04-14	Sparks et al.	
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	187	9014059	B2	2015-04-21	Richardson et al.	
	188	9014973	B2	2015-04-21	Ruckart, John	
	189	9015331	B2	2015-04-21	Lai et al.	
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	192	9032427	B2	2015-05-12	Gallant et al.	
	193	9049010		2015-06-02	Jueneman et al.	
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	195	9105031	B2	2015-08-11	Shen et al.	

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	198	9111088	B2	2015-08-18	Ghai et al.	
	199	9135037	B1	2015-09-15	Petrescu-Prahova et al.	
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	201	9143933	B2	2015-09-22	Ikeda et al.	
	202	9158579	B1	2015-10-13	Robles	
	203	9172553	B2	2015-10-27	Dawes et al.	
	204	9173090	B2	2015-10-27	Tuchman et al.	
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	208	9225847	B2	2015-12-29	Daymond et al.	
	209	9252977	B2	2016-02-02	Levi et al.	
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	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	220	9344557	B2	2016-05-17	Gruchala et al.	
	221	9350842	B2	2016-05-24	Swanburg et al.	
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	Attorney Docket Number	RALEP037D1C1C1C1C1

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	Attorney Docket Number	RALEP037D1C1C1C1C1

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	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

CERTIFICATION STATEMENT

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

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See attached certification statement.

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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	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
Name/Print	James E. Harris	Registration Number	40013

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	Examiner Name	
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	1	20100199325	A1	2013-03-05	Raleigh	
	2	20040098610	A1	2004-05-20	Hrastar, Scott E.	
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	Attorney Docket Number	RALEP037D1C1C1C1C1

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	1	Arai, Masato, et al; "A Proposal for an Effective Information Flow Control Model for Sharing and Protecting Sensitive Information", Proc. 7th Australasian Information Security Conference (AISC 2009), Wellington, New Zealand	☐

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☐ See attached certification statement.

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☒ A certification statement is not submitted herewith.

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Signature	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-11-08
Name/Print	Farshad Farjami	Registration Number	41014

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3	2024-01-24 21:26 UTC	328,095	4
4	2024-01-24 21:31 UTC	10,515,529	4
5	2024-01-24 21:37 UTC	73,445,473	4

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1 **2024-01-24 21:14 UTC | 67,716,750 results from**

De-Dup: None | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
network access service notification messages and end user device

Concept Modifiers: None

Filters: None

2 **2024-01-24 21:19 UTC | 3,838,793 results from**

De-Dup: None | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
service design center and notification and policy and trigger

Concept Modifiers: None

Filters: None

3 **2024-01-24 21:26 UTC | 328,095 results from**

De-Dup: None | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
network provisioning instruction translator and trigger identification

Concept Modifiers: None

Filters: None

4 **2024-01-24 21:31 UTC | 10,515,529 results from**

De-Dup: None | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
network provisioning system and element and monitoring service usage

Concept Modifiers: None

Filters: None

5 **2024-01-24 21:37 UTC | 73,445,473 results from**

De-Dup: None | **Relevance Cut-off:** None | **Sort:** Relevance

Main Concept: Text
network element and monitor and service usage and trigger condition

Concept Modifiers: None

Filters: None

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

PTO/SB/08a (01-22)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	17567594
Filing Date	2022-01-03
First Named Inventor	RALEIGH, GREGORY
Art Unit	OPAP
Examiner Name	NOT YET ASSIGNED
Attorney Docket Number	RALEP037D1C1C1C1C1

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	1	101437224	CN	A	2009-05-20	Yang et al.		
	2	2381711	EP	A1	2011-10-26	Yang et al.		

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	Attorney Docket Number	RALEP037D1C1C1C1C1

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).

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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	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-07-07
Name/Print	Farshad Farjami	Registration Number	41014

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

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Examiner Name	not yet assigned
Attorney Docket Number	RALEP037D1C1C1C1C1

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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	5131020	A	1992-07-14	Liebesny et al.	
	2	5283904		1994-02-01	CARSON, David G. et al.	
	3	5325532	A	1994-06-28	Crosswy et al.	
	4	5572528	A	1996-11-05	Shuen, Pauline	
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	6	5594777		1997-01-14	Makkonen, Matti et al.	
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	Attorney Docket Number	RALEP037D1C1C1C1C1

	9	5633484	A	1997-05-27	Zancho, William F. et al.	
	10	5633868	A	1997-05-27	Baldwin et al.	
	11	5751719	A	1998-05-12	Chen et al.	
	12	5754953	A	1998-05-19	Briancon et al.	
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	16	5889477		1999-03-30	Fastenrath, Ulrich	
	17	5892900		1999-04-06	GINTER et al.	
	18	5903845		1999-05-11	BUHRMANN et al.	
	19	5915008	A	1999-06-22	Dulman, Scott	

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	21	5933778		1999-08-03	BUHRMANN et al.	
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	1	20080034063	A1	2008-02-07	Yee, Robert	
	2	20080034419	A	2008-02-07	Mullick et al.	
	3	20080039102		2008-02-14	SEWALL et al.	
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	6	20080051076		2008-02-28	O'Shaughnessy, John et al.	
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	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

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Examiner Signature	/NAZIA NAOREEN/	Date Considered	01/24/2024

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Signature	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
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Art Unit	N/A
Examiner Name	NOT YET ASSIGNED
Attorney Docket Number	RALEP037D1C1C1C1C1

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	2	5987611	A	1999-11-16	Freund	
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	5	9277445	B2	2016-03-01	Raleigh et al.	
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	1	1484871	EP	A1	2004-12-08	Kelz et al.		☐

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	1	IPR2023-01157: Petition for Inter Partes Review of United States Patent No. 11,405,224, filed July 20, 2023.	☐
	2	IPR2023-01226: Petition for Inter Partes Review of United States Patent No. 10,237,773, filed July 21, 2023.	☐
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	5	Complaint filed in Headwater Research LLC v. Samsung Electronics Co., Ltd. et al., dated December 6, 2022, Case No. 2:22-cv-00467, E.D. Texas.	☐
	6	File History of U.S. Patent No. 9,277,445 (Raleigh et al.), issued March 1, 2016	☐
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Signature	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-07-26
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	42	6505114		2003-01-07	LUCIANI, Sergio	
	43	6510152	B1	2003-01-21	Gerszberg et al.	
	44	6522629	B1	2003-02-18	Anderson, Sr., Ronald D.	
	45	6526066	B1	2003-02-25	Weaver	
	46	6532235		2003-03-11	BENSON et al.	
	47	6532579		2003-03-11	SATO et al.	
	48	6535855	B1	2003-03-18	Cahill et al.	
	49	6535949	B1	2003-03-18	Parker, Kenneth W.	
	50	6539082		2003-03-25	LOWE et al.	
	51	6542465	B1	2003-04-01	Wang	
	52	6542500	B1	2003-04-01	Gerszberg et al.	

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	53	6542992		2003-04-01	Peirce, Kenneth L. et al.	
	54	6546016	B1	2003-04-08	Gerszberg et al.	
	55	6563806		2003-05-13	YANO et al.	
	56	6570974	B1	2003-05-27	Gerszberg et al.	
	57	6574321		2003-06-03	COX et al.	
	58	6574465		2003-06-03	MARSH et al.	
	59	6578076	B1	2003-06-10	Putzolu, David Matthew	
	60	6581092		2003-06-17	MOTOYAMA, Tetsuro	
	61	6591098	B1	2003-07-08	Shieh et al.	
	62	6598034	B1	2003-07-22	Kloth, Axel K.	
	63	6601040	B1	2003-07-29	Kolls, H. Brock	

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	64	6603969		2003-08-05	VUORISTO et al.	
	65	6603975	B1	2003-08-05	Inouchi et al.	
	66	6606744		2003-08-12	MIKURAK, Michael G.	
	67	6615034	B1	2003-09-02	Alloune et al.	
	68	6628934	A	2003-09-30	Rosenberg et al.	
	69	6631122		2003-10-07	ARUNACHALAM, Vaidhyanathan et al.	
	70	6636721	B2	2003-10-21	Threadgill et al.	
	71	6639975	B1	2003-10-28	O'Neal et al.	
	72	6640097		2003-10-28	Corrigan, Louis et al.	
	73	6640334	B	2003-10-28	Rasmussen, John H.	
	74	6650887		2003-11-18	McGREGOR et al.	

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	75	6651101		2003-11-18	GAI et al.	
	76	6654786	B1	2003-11-25	Fox et al.	
	77	6654814		2003-11-25	Britton, Kathryn H. et al.	
	78	6658254		2003-12-02	PURDY et al.	
	79	6662014	B1	2003-12-09	Walsh, Patrick Jay	
	80	6678516	B2	2004-01-13	Nordman et al.	
	81	6683853		2004-01-27	Kannas, Chris et al.	
	82	6684244		2004-01-27	GOLDMAN et al.	
	83	6690918	B2	2004-02-10	Evans et al.	
	84	6694362	B1	2004-02-17	Secor et al.	
	85	6697821	B2	2004-02-24	Ziff et al.	

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	86	6704873	B1	2004-03-09	Underwood	
	87	6725031		2004-04-20	WATLER et al.	
	88	6725256	B1	2004-04-20	Albal et al.	
	89	6732176	B1	2004-05-04	Stewart et al.	
	90	6735206	B1	2004-05-11	Oki et al.	
	91	6748195	B1	2004-06-08	Phillips, W. Garland	
	92	6748437	B1	2004-06-08	Mankude et al.	
	93	6751296	B1	2004-06-15	Albal et al.	
	94	6754470		2004-06-22	Hendrickson, Keith et al.	
	95	6757717	B1	2004-06-29	Goldstein, Leonid	
	96	6760417	B1	2004-07-06	Wallenius, Jukka	

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	97	6763000		2004-07-13	WALSH, Peter J.	
	98	6763226	B1	2004-07-13	McZeal Jr., Alfred	
	99	6765864		2004-07-20	NATARAJAN et al.	
	100	6765925		2004-07-20	Sawyer, Wilson et al.	
	101	6782412		2004-08-24	BROPHY, Kevin et al.	
	102	6785889		2004-08-31	WILLIAMS, Peter	
	103	6792461	B1	2004-09-14	Hericourt, Olivier	
	104	6829596		2004-12-07	FRAZEE, Steve	
	105	6829696		2004-12-07	BALMER et al.	
	106	6839340		2005-01-04	Voit, Eric A. et al.	
	107	6842628	B1	2005-01-11	Arnold et al.	

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	108	6873988	B2	2005-03-29	Herrmann et al.	
	109	6876653		2005-04-05	AMBE, Shekhar et al.	
	110	6879825	B1	2005-04-12	Daly, Brian Kevin	
	111	6882718	B1	2005-04-19	Smith, Benjamin V.	
	112	6885997	B1	2005-04-26	Roberts, David T.	
	113	6901440	B1	2005-05-31	Bimm et al.	
	114	6920455		2005-07-19	WESCHLER, Paul	
	115	6922562		2005-07-26	Ward, Stephen L. et al.	
	116	6928280		2005-08-09	Xanthos, James et al.	
	117	6934249	B1	2005-08-23	Bertin, Olivier et al.	
	118	6934751	B2	2005-08-23	Jayapalan et al.	

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	119	6947723		2005-09-20	Gurnani, Roger et al.	
	120	6947985	B2	2005-09-20	Hegli et al.	
	121	6952428		2005-10-04	NECKA et al.	
	122	6957067		2005-10-18	Iyer, Pradeep J. et al.	
	123	6959202	B2	2005-10-25	Heinonen et al.	
	124	6959393	B2	2005-10-25	Hollis et al.	
	125	6965667		2005-11-15	TRABANDT et al.	
	126	6965872		2005-11-15	Grdina, Jerome M.	
	127	6967958		2005-11-22	ONO, Yoshiyuki et al.	
	128	6970692	B2	2005-11-29	Tysor, Arthur James	
	129	6970927	B1	2005-11-29	Stewart et al.	

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	130	6982733	B1	2006-01-03	McNally et al.	
	131	6983370	B2	2006-01-03	Eaton et al.	
	132	6996062	B1	2006-02-07	Freed et al.	
	133	6996076		2006-02-07	FORBES et al.	
	134	6996393		2006-02-07	Pyhalammi, Seppo et al.	
	135	6998985		2006-02-14	REISMAN et al.	
	136	7000001	B2	2006-02-14	Lazaridis	
	137	7002920		2006-02-21	Ayyagari, Deepak et al.	
	138	7007295	B1	2006-02-28	Rose et al.	
	139	7013469	B2	2006-03-14	Smith et al.	
	140	7017189	B1	2006-03-21	DeMello et al.	

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	141	7020781	B1	2006-03-28	Saw et al.	
	142	7024200		2006-04-04	McKENNA et al.	
	143	7024460	B2	2006-04-04	Koopmas et al.	
	144	7027055	B2	2006-04-11	Anderson et al.	
	145	7027408		2006-04-11	NABKEL et al.	
	146	7031733	B2	2006-04-18	Alminana et al.	
	147	7032072	B1	2006-04-18	Quinn et al.	
	148	7039027	B2	2006-05-02	Bridgelall, Raj	
	149	7039037		2006-05-02	Wang, Jiwei R. et al.	
	150	7039403		2006-05-02	Wong, Gregory A.	
	151	7039713	B1	2006-05-02	Van Gunter, David et al.	

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	152	7042988		2006-05-09	JUITT et al.	
	153	7043225	B1	2006-05-09	Patel et al.	
	154	7043226		2006-05-09	Yamauchi, Toshiaki	
	155	7043268	B2	2006-05-09	Yukie et al.	
	156	7047276	B2	2006-05-16	Liu et al.	
	157	7058022	B1	2006-06-06	Carolan et al.	
	158	7058968		2006-06-06	ROWLAND et al.	
	159	7068600		2006-06-27	CAIN, Joseph Bibb	
	160	7069248		2006-06-27	HUBER, Adriano	
	161	7082422	B1	2006-07-25	Zirngibl et al.	
	162	7084775	B1	2006-08-01	Smith, Michael R.	

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	163	7092696		2006-08-15	HOSAIN et al.	
	164	7095754	B2	2006-08-22	Benveniste, Mathilde	
	165	7099943	B1	2006-08-29	Tondering	
	166	7102620	B2	2006-09-05	Harries, Andrew Stanely Guy et al.	
	167	7110753	B2	2006-09-19	Campen, Kenneth Brian	
	168	7113780	B2	2006-09-26	Mckenna Daniel et al.	
	169	7113997		2012-09-26	Jayapalan, Jay et al.	
	170	7120133	B1	2006-10-10	Joo et al.	
	171	7131578	B2	2006-11-07	Paschini et al.	
	172	7133386	B2	2006-11-07	Holur et al.	
	173	7133695	B2	2006-11-07	Beyda, William J.	

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	174	7133907	B2	2006-11-07	Carlson et al.	
	175	7136361	B2	2006-11-14	Benveniste, Mathilde	
	176	7139569	B2	2006-11-21	Kato, Akira	
	177	7142876		2006-11-28	TROSSEN et al.	
	178	7149229	B1	2006-12-12	Leung, Kent K.	
	179	7149521	B2	2006-12-12	Sundar et al.	
	180	7151764	B1	2006-12-19	Heinonen et al.	
	181	7158792		2007-01-02	COOK et al.	
	182	7162237	B1	2007-01-09	Silver et al.	
	183	7165040	B2	2007-01-16	Ehrman et al.	
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	185	7171199	B1	2007-01-30	Rahman	
	186	7174156	B1	2007-02-06	Mangal, Manish	
	187	7174174		2007-02-06	BORIS et al.	
	188	7177919	B1	2007-02-13	Truong et al.	
	189	7180855		2007-02-20	LIN , Wei	
	190	7181017		2007-02-20	Nagel, Robert H. et al.	
	191	7191248	B2	2007-03-13	Chattopadhyay et al.	
	192	7197321		2007-03-27	ERSKINE et al.	
	193	7200112	B2	2007-04-03	Sundar et al.	
	194	7200551	B1	2007-04-03	Senez	
	195	7203169	B1	2007-04-10	Okholm, Jon et al.	

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	196	7203721	B1	2007-04-10	Ben-Efraim et al.	
	197	7203752	B2	2007-04-10	Rice et al.	
	198	7207041	B2	2007-04-17	Elson et al.	
	199	7209664	B1	2007-04-24	McNicol et al.	
	200	7212491		2007-05-01	Koga, Takahiro	
	201	7219123	B1	2007-05-15	Fiechter et al.	
	202	7222190	B2	2007-05-22	Klinker et al.	
	203	7222304	B2	2007-05-22	Beaton et al.	
	204	7224968	B2	2007-05-29	Dobson et al.	
	205	7228354		2007-06-05	CHAMBLISS, David Darden et al.	
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	207	7242668	B2	2007-07-10	Kan et al.	
	208	7242920		2007-07-10	MORRIS, Robert P.	
	209	7245901		2007-07-17	McGREGOR et al.	
	210	7248570	B2	2007-07-24	Bahl et al.	
	211	7248868	B2	2007-07-24	Snyder et al.	
	212	7251218		2007-07-31	Jorgensen, Jacob W.	
	213	7260382	B1	2007-08-21	Lamb et al.	
	214	7266371	B1	2007-09-04	Amin et al.	
	215	7269157	B2	2007-09-11	Klinker et al.	
	216	7271765	B2	2007-09-18	Stilp et al.	
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	218	7280816		2007-10-09	FRATTI et al.	
	219	7280818		2007-10-09	CLAYTON, Steve	
	220	7283561		2007-10-16	Picher-Dempsey, Heidi	
	221	7283963		2007-10-16	FITZPATRICK, John E. et al.	
	222	7286834	B2	2007-10-23	Walter	
	223	7286848	B2	2007-10-23	Vireday, Richard P. et al.	
	224	7289489		2007-10-30	KUNG et al.	
	225	7290283		2007-10-30	COPELAND III, John A.	
	226	7310424		2007-12-18	Gehring, Stephan Walter et al.	
	227	7313237	B2	2007-12-25	Bahl, Paramvir et al.	
	228	7315892	B2	2008-01-01	Freimuth et al.	

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	229	7317699		2008-01-08	GODFREY et al.	
	230	7318111	B2	2008-01-08	Zhao, Wen	
	231	7320029	B2	2008-01-15	Rinne et al.	
	232	7320781	B2	2008-01-22	Lambert et al.	
	233	7322044		2008-01-22	HRASTAR, Scott E.	
	234	7324447		2008-01-29	MORFORD, Michael Robert	
	235	7325037		2008-01-29	LAWSON, Karen L.	
	236	7336960		2008-02-26	ZAVALKOVSKY et al.	
	237	7340244	B1	2008-03-04	Osborne et al.	
	238	7340772	B2	2008-03-04	Panasyuk et al.	
	239	7346410		2008-03-18	UCHIYAMA, Kenji	

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	240	7349695		2008-03-25	OOMMEN et al.	
	241	7349698	B2	2008-03-25	Gallagher et al.	
	242	7353533	B2	2008-04-01	Wright et al.	
	243	7356011		2008-04-08	Waters, Christopher J.F. et al.	
	244	7356337		2008-04-08	FLORENCE, Shahar	
	245	7366497		2008-04-29	NAGATA, Hideaki	
	246	7366654	B2	2008-04-29	Moore, Robert C.	
	247	7366934	B1	2008-04-29	Narayan et al.	
	248	7369848	B2	2008-05-06	Jiang, Yue Jun	
	249	7369856	B2	2008-05-06	Ovadia, Shlomo	
	250	7373136		2008-05-13	WATLER et al.	

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	251	7373179		2008-05-13	Stine, Ted et al.	
	252	7379731	B2	2008-05-27	Natsuno et al.	
	253	7388950		2008-06-17	ELSEY et al.	
	254	7389412	B2	2008-06-17	Sharma et al.	
	255	7391724	B2	2008-06-24	Alakoski et al.	
	256	7395056	B2	2008-07-01	Petermann	
	257	7395244	B1	2008-07-01	Kingsford, Bryan	
	258	7401338		2008-07-15	BOWEN et al.	
	259	7403763		2008-07-22	MAES, Stephane H.	
	260	7409447	B	2008-08-05	Assadzadeh, Alireza	
	261	7409569	B2	2008-08-05	Illowsky et al.	

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	262	7411930	B2	2008-08-12	Montojo et al.	
	263	7418253		2008-08-26	KAVANAH, Alan	
	264	7418257		2008-08-26	Kim, Myong-Ju	
	265	7421004		2008-09-02	FEHER, Kamilo	
	266	7423971	B1	2008-09-09	Mohaban et al.	
	267	7428750	B1	2008-09-23	Dunn et al.	
	268	7433362	B2	2008-10-07	Mallya et al.	
	269	7436816	B2	2008-10-14	Mehta et al.	
	270	7440433	B2	2008-10-21	Rink et al.	
	271	7444669	B1	2008-10-28	Bahl, Paramvir et al.	
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	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	1	2010128391	WO	A3	2011-01-20	Momtahan et al.			
	2	2011002450	WO	A1	2011-01-06	Alcatel-Lucent USA Inc.			
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CERTIFICATION STATEMENT

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☒ 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	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
Name/Print	James E. Harris	Registration Number	40013

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	Art Unit	
	Examiner Name	Unknown
	Attorney Docket Number	RALEP037D1C1C1C1C1

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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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	Examiner Name	Unknown
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	1	03100581	WO	A2	2003-12-04	Dive-Reclus et al.		☐

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	1	Banchs, et. al., Distributed weighted fair queuing in 802.11 wireless LAN, 2002 IEEE International Conference on Communications, Conference Proceedings. ICC 2002 pp. 3121-3127), 2002	☐
	2	Buxton, B., "Integrating the Periphery and Context: A New Model of Telematics," in Proceedings of Graphics Interface '95, in GI'95. 1995	☐
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	9	File History of IPR2023-01250; filed on August 14, 2023	☐
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	21	IETF RFC 791, Internet Protocol, September 1981, downloaded from the internet at https://www.ietf.org/rfc/rfc791.txt on July 28, 2023	☐
	22	IPR2023-01250: Petition for Inter Partes Review of United States Patent No.: 9,277,433, filed on August 14, 2023	☐
	23	IPR2023-01253; Petition for Inter Partes Review of United States Patent No. 9,143,976, filed on August 11, 2023	☐
	24	Model-View-Controller", Microsoft Patterns & Practices, March 17, 2014, 9 pages, downloaded from the internet at http://msdn2.microsoft.com/ en-us/library/ms978748.aspx on July 29, 2023	☐
	25	Overview of the IEEE 802.11 Standard, December 6, 2001, downloaded from the internet at https://www.informit.com/articles/article.aspx?p=24411&seqNum=5 on July 29, 2023	☐
	26	Samsung Stipulation letter, dated August 11, 2023 in Headwater Research LLC v. Samsung Electronics Co., Ltd. et al., Case No. 2:22-cv-00422, E.D. Texas	☐
	27	Samsung Stipulation letter, dated August 14, 2023 in Headwater Research LLC v. Samsung Electronics Co., Ltd., et al., Case No. 2:22-cv-00422, E.D. Texas	☐
	28	Shuler, "How Does the Internet Work?", downloaded from, the internet at https://web.stanford. edu/class/msande91si/www-spr04/readings/week1/InternetWhitepaper. htm on July 29, 2023	☐

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	29	Richard Stevens et al., "UNIX Network Programming Volume 1, Third Edition: The Sockets Networking API," 2004, ISBN: 0-13-141155-1	☐
	30	Excerpts, Computer Networks, Fourth Edition, by Andrew Tanenbaum, Prentice Hall, 2003	☐
	31	Excerpts, Stevens "TCP/IP Illustrated", Volume 1, Addison-Wesley Publishing Company, 1994	☐
	32	USB720 Modem Hardware User Manual, 2006, downloaded from the internet at http://s7.vzw.com/is/content/Verizon-Wireless/Devices/Verizon/Userguides/vzw-usb720-modemum.pdf on July 31, 2023	☐
	33	Want, "When Cell Phones Become Computers", IEEE Pervasive Computing, Vol. 8, April-June 2009, pp. 2-5	☐
	34	Welsh, "Incorporating Memory Management into User-Level Network Interfaces." IEEE Micro, 18(2), 1998, 10 pages	☐

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Signature	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-10-06
Name/Print	Farshad Farjami	Registration Number	41014

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	1	20040224668	A1	2004-11-11	Shell, Scott R. et al.	

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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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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	Unknown
	Attorney Docket Number	RALEP037D1C1C1C1C1

	1	Jon Inouye et al., „Dynamic Network Reconfiguration Support for Mobile Computers“, Proceedings of the 3rd annual ACM/IEEE International Conference on Mobile Computing and Networking (MobiCom ’97), published September 1997	☐

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Examiner Signature	/NAZIA NAOREEN/	Date Considered	01/24/2024

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

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SIGNATURE

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Signature	/Farshad Farjami/	Date (YYYY-MM-DD)	2024-01-09
Name/Print	Farshad Farjami	Registration Number	41014

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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
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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	20040224668	A1	2004-11-11	Shell, Scott R. et al.	
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FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Signature	/Farshad Farjami/	Date (YYYY-MM-DD)	2024-01-09
Name/Print	Farshad Farjami	Registration Number	41014

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APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/567,594	**01/09/2024 06:12:40 PM Z ET**	**RALEP037D1C1C1C1C1**

Title of Invention

Enterprise Access Control and Accounting Allocation for Access Networks

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1081	FILED BY	Evan Gunderman
PATENT CENTER #	63894221	FILING DATE	01/03/2022
CUSTOMER #	106963	FIRST NAMED INVENTOR	Gregory G. Raleigh
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Michael Farjami

Documents

TOTAL DOCUMENTS: 2

DOCUMENT		PAGES	DESCRIPTION	SIZE (KB)
RALEP037D1C1C1C1C1_IDS_Jan_9_24.pdf		13	-	4344 KB
RALEP037D1C1C1C1C1_IDS_Jan_9_24-IDS.pdf	(1-3)	3	Information Disclosure Statement (IDS) Form (SB08)	700 KB
RALEP037D1C1C1C1C1_IDS_Jan_9_24-NPL.pdf	(4-13)	10	Non Patent Literature	3646 KB

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DOCUMENT	MESSAGE DIGEST(SHA-512)

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RALEP037D1C1C1C1C1_IDS_Jan_9_24-NPL.pdf	B6BAC1AAEF851E4FDA18B72C79C9DD93104E3F4B2E4F4CB60EC1317E0293BBCBD28D48764D6BF63A4F6345E88BD5D5D6E77B8BE4107631681CE460F36C788BFE

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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
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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
	1	20100199325	A1	2013-03-05	Raleigh	
	2	20040098610	A1	2004-05-20	Hrastar, Scott E.	
If you wish to add additional U.S. Published Application citation information please click the Add button.						

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	Art Unit	
	Examiner Name	
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	1	Arai, Masato, et al; "A Proposal for an Effective Information Flow Control Model for Sharing and Protecting Sensitive Information", Proc. 7th Australasian Information Security Conference (AISC 2009), Wellington, New Zealand	☐

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Examiner Signature		Date Considered	

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Signature	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-11-08
Name/Print	Farshad Farjami	Registration Number	41014

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Electronic Acknowledgement Receipt	
EFS ID:	48812329
Application Number:	17567594
International Application Number:	
Confirmation Number:	1081
Title of Invention:	Enterprise Access Control and Accounting Allocation for Access Networks
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	106963
Filer:	Michael Farjami/Evan Gunderman
Filer Authorized By:	Michael Farjami
Attorney Docket Number:	RALEP037D1C1C1C1C1
Receipt Date:	08-NOV-2023
Filing Date:	03-JAN-2022
Time Stamp:	18:46:28
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		RALEP037D1C1C1C1C1_IDS_Nov_8_23.pdf	3378349 a99844f574365e43227256c002706bee0f4bd3e8	yes	13

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	Non Patent Literature	4	13
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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	7821985		2010-10-26	Van Megen	
	2	7023909		2006-04-04	Adams	
	3	9408070		2006-08-02	Altbaum	
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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	20080101293		2008-05-01	Woo	
	2	20060039364		2006-02-23	Wright	
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	1	2006012018	WO			Sadowsky		☐

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	1	A. Freier, et al., The Secure Sockets Layer (SSL) Protocol Version 3.0, Internet Engineering Task Force (IETF), Request for Comments: 6101, ISSN: 2070-1721, August 2011, available at https://datatracker.ietf.org/doc/html/rfc6101	☐
	2	M. V. Pedersen, F. H. P. Fitzek, and T. Larsen, "Implementation and Performance Evaluation of Network Coding for Cooperative Mobile Devices," ICC Workshops - 2008 IEEE International Conference on Communications Workshops, Beijing, China: IEEE, May 2008, pp. 91–96. doi: 10.1109/ICCW.2008.22	☐
	3	W. R. Stevens, "TCP/IP Illustrated, Volume 1," 2003, ISBN: 0-13-141155-1 ("Stevens")	☐
	4	Bajaj, et al., IETF RFC 3198, Web Services Policy 1.2 - Framework (WS-Policy), April 25, 2006, downloaded from the internet at https://www.w3.org/Submission/WS-Policy/ on August 29, 2023	☐
	5	Sloman, et. al., "Security and management policy specification." IEEE Network, March/April 2002 pp. 10-19	☐
	6	Lu, et. al., "Comparing system level power management policies." IEEE Design & Test of Computers, March/April 2001 pp. 10-19	☐
	7	Davie, et al., IETF RFC 3246, An Expedited Forwarding PHB (Per-Hop Behavior), March 2002, downloaded from the internet at https://datatracker.ietf.org/doc/html/rfc3246 on September 5, 2023	☐
	8	Excerpts, The New Penguin Dictionary of Computing, by Dick Pountain, 2001	☐

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	Examiner Name	Unknown
	Attorney Docket Number	RALEP037D1C1C1C1C1

	9	Westerinen, et al., IETF RFC 3198, Terminology for Policy-Based Management, November 2001, downloaded from the internet at https://www.ietf.org/rfc/rfc3198.txt on August 15, 2023.	☐
	10	Yavatkar, IETF RFC 2753, A Framework for Policy-Based Admission Control, January 2000, downloaded from the internet at https://datatracker.ietf.org/doc/html/rfc2753 on September 5, 2023	☐
	11	IPR2023-01360; Petition for Inter Partes Review of United States Patent No. 9,609,544, filed on September 11, 2023	☐
	12	IPR2023-01361; Petition for Inter Partes Review of United States Patent No. 9,271,184, filed on September 8, 2023	☐
	13	IPR2023-01362; Petition for Inter Partes Review of United States Patent No. 9,271,184, filed on September 8, 2023	☐
	14	IPR2023-01336; Petition for Inter Partes Review of United States Patent No. 9,137,701, filed on August 25, 2023	☐
	15	IPR2023-01337; Petition for Inter Partes Review of United States Patent No. 9,521,578, filed on August 25, 2023	☐
	16	IPR2023-01462; Petition for Inter Partes Review of United States Patent No. 9,277,445, filed on September 28, 2023	☐
	17	D. P. Bovet, "Understanding the Linux Kernel," 2000, ISBN: 0-596-00002-2	☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	Unknown
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	Art Unit	
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CERTIFICATION STATEMENT

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☐ 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.

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Signature	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-10-19
Name/Print	Farshad Farjami	Registration Number	41014

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Electronic Acknowledgement Receipt	
EFS ID:	48742374
Application Number:	17567594
International Application Number:	
Confirmation Number:	1081
Title of Invention:	Enterprise Access Control and Accounting Allocation for Access Networks
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	106963
Filer:	Michael Farjami/Evan Gunderman
Filer Authorized By:	Michael Farjami
Attorney Docket Number:	RALEP037D1C1C1C1C1
Receipt Date:	19-OCT-2023
Filing Date:	03-JAN-2022
Time Stamp:	19:15:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	RALEP037D1C1C1C1C1_IDS_Oct_19_23.pdf	1081380 531bef94b3acdfeb00b79baafa136f0ce1e6fe1c	no	5

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National Stage of an International Application under 35 U.S.C. 371

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	Examiner Name	Unknown
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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	7757185	B2	2010-07-13	Paquette et al.	
	2	8381127	B2	2013-02-19	Singh et al.	
	3	8407345	B2	2013-03-26	Lim	
	4	8413172	B2	2013-04-02	Sng	
	5	8886261	B2	2014-11-11	Aerrabotu	
	6	5987611	A1	2016-11-16	Freund	
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	1	20070173283	A1	2007-07-26	Livet et al.	
	2	20080146268	A1	2008-06-19	Gandhi et al.	
	3	20080311897	A1	2008-12-18	Segal	
	4	20060039354	A1	2006-02-23	Rao	
	5	20070038763	A1	2007-02-15	Oestvall	
	6	20090207817	A1	2009-08-20	Montemurro	
	7	20080080458	A1	2008-04-03	Cole	
	8	20090217065	A1	2009-08-27	Araujo	
	9	20100115048	A1	2010-05-06	Scahill	
	10	20090093247	A1	2009-04-09	Srinivasan	
	11	20090019022	A1	2009-01-15	Schallert	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	03100581	WO	A2	2003-12-04	Dive-Reclus et al.		☐

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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	Banchs, et. al., Distributed weighted fair queuing in 802.11 wireless LAN, 2002 IEEE International Conference on Communications, Conference Proceedings. ICC 2002 pp. 3121-3127), 2002	☐
	2	Buxton, B., "Integrating the Periphery and Context: A New Model of Telematics," in Proceedings of Graphics Interface '95, in GI'95. 1995	☐
	3	Carter, Casey et al., "Contact networking: a localized mobility system," Proceedings of the 1st International Conference on Mobile systems, Applications and Services, 2003	☐
	4	File History of U.S. Patent No. 9,277,433 (Raleigh, et al.), issued March 1, 2016	☐
	5	Burt, "Competition in Mobile Chips to Grow in 2009: In-Stat," eWEEK, August 18, 2009, downloaded from the internet at https://www.eweek.com/pc-hardware/competition-inmobile-chips-to-grow-in-2009-in-stat/ on July 29, 2023	☐
	6	Enck, et. al., Understanding Android Security, IEEE Security & Privacy Magazine, Vol.7, No.1, 78 pages, January/ February 2009	☐

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	7	Excerpts, Rosen, et al. "UNIX: The Complete Reference", Second Edition, McGraw-Hill 2007	☐
	8	Bray, et. al., Extensible Markup Language (XML) 1.1 (Second Edition), W3C, 2006, August 16, 2006, 41 pages, downloaded from the internet at https://www.w3.org/TR/2006/REC-xml11-20060816/ on July 29, 2023	☐
	9	File History of IPR2023-01250; filed on August 14, 2023	☐
	10	File History of IPR2023-01253, filed on August 11, 2023	☐
	11	File History of U.S. Patent No. 9,143,976 (Raleigh, et al.), issued September 22, 2015	☐
	12	David Flanagan, O'Reilly & Associates, Inc., "Java in a Nutshell," 1996, ISBN: I-56592-183-6	☐
	13	Flinn, Jason, et al. "The case for intentional networking," Proceedings of the 10th Workshop on Mobile Computing Systems and Applications, 2009	☐
	14	Hinckley et al., "Foreground and background interaction with sensor-enhanced mobile devices," ACM Trans. Comput. Hum. Interact., vol. 12, no. 1, pp. 31–52, Mar. 2005	☐
	15	Nichols, et. al., IETF RFC 2474, "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers," December 1998, downloaded from the internet t https://datatracker.ietf.org/doc/html/rfc2474 on July 29, 2023	☐
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	17	Durham, et. al., IETF RFC 2748, "The COPS (Common Open Policy Service) Protocol," January 2000, downloaded from the internet at https://www.rfc-editor. org/rfc/rfc2748.html on August 1, 2023	☐

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	18	Westerinen, et al., IETF RFC 3198, Terminology for Policy-Based Management, November 2001, available at https://www.ietf.org/rfc/rfc3198.txt	☐
	19	Babiarz, et al., IETF RFC 4594, Configuration Guidelines for DiffServ Service Classes, August 2006, downloaded from the internet at https://datatracker.ietf.org/doc/html/rfc4594 on July 29, 2023	☐
	20	Schulzrinne, et. al., IETF RFC 4745, "Common Policy: A Document Format for Expressing Privacy Preferences," February 2007, downloaded from the internet at https://datatracker. ietf.org/doc/html/rfc4745 on July 29, 2023	☐
	21	IETF RFC 791, Internet Protocol, September 1981, downloaded from the internet at https://www.ietf.org/rfc/rfc791.txt on July 28, 2023	☐
	22	IPR2023-01250: Petition for Inter Partes Review of United States Patent No.: 9,277,433, filed on August 14, 2023	☐
	23	IPR2023-01253; Petition for Inter Partes Review of United States Patent No. 9,143,976, filed on August 11, 2023	☐
	24	Model-View-Controller", Microsoft Patterns & Practices, March 17, 2014, 9 pages, downloaded from the internet at http://msdn2.microsoft.com/ en-us/library/ms978748.aspx on July 29, 2023	☐
	25	Overview of the IEEE 802.11 Standard, December 6, 2001, downloaded from the internet at https://www.informit.com/articles/article.aspx?p=24411&seqNum=5 on July 29, 2023	☐
	26	Samsung Stipulation letter, dated August 11, 2023 in Headwater Research LLC v. Samsung Electronics Co., Ltd. et al., Case No. 2:22-cv-00422, E.D. Texas	☐
	27	Samsung Stipulation letter, dated August 14, 2023 in Headwater Research LLC v. Samsung Electronics Co., Ltd., et al., Case No. 2:22-cv-00422, E.D. Texas	☐
	28	Shuler, "How Does the Internet Work?", downloaded from, the internet at https://web.stanford. edu/class/msande91si/www-spr04/readings/week1/InternetWhitepaper. htm on July 29, 2023	☐

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	29	Richard Stevens et al., "UNIX Network Programming Volume 1, Third Edition: The Sockets Networking API," 2004, ISBN: 0-13-141155-1	☐
	30	Excerpts, Computer Networks, Fourth Edition, by Andrew Tanenbaum, Prentice Hall, 2003	☐
	31	Excerpts, Stevens "TCP/IP Illustrated", Volume 1, Addison-Wesley Publishing Company, 1994	☐
	32	USB720 Modem Hardware User Manual, 2006, downloaded from the internet at http://s7.vzw.com/is/content/Verizon-Wireless/Devices/Verizon/Userguides/vzw-usb720-modemum.pdf on July 31, 2023	☐
	33	Want, "When Cell Phones Become Computers", IEEE Pervasive Computing, Vol. 8, April-June 2009, pp. 2-5	☐
	34	Welsh, "Incorporating Memory Management into User-Level Network Interfaces." IEEE Micro, 18(2), 1998, 10 pages	☐

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Signature	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-10-06
Name/Print	Farshad Farjami	Registration Number	41014

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Electronic Acknowledgement Receipt	
EFS ID:	48692738
Application Number:	17567594
International Application Number:	
Confirmation Number:	1081
Title of Invention:	Enterprise Access Control and Accounting Allocation for Access Networks
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	106963
Filer:	Michael Farjami/Evan Gunderman
Filer Authorized By:	Michael Farjami
Attorney Docket Number:	RALEP037D1C1C1C1C1
Receipt Date:	06-OCT-2023
Filing Date:	03-JAN-2022
Time Stamp:	19:41:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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12	Non Patent Literature	Exhibit_1025_Hinckley_Foreground_and_background_interaction_with_sensor-enhanced_mobile-devices.pdf	1735896 92ec95753d30a5324281991efe10f4e7cce4ce37	no	22
Warnings:					
Information:					
13	Non Patent Literature	Exhibit_1025_IETF_RFC_2475.pdf	1136006 6f1b281ade28f21544b2fccef55dddb63ac11fc0	no	36
Warnings:					
Information:					
14	Non Patent Literature	Exhibit_1036_IETF_RFC_2748.pdf	1586094 c259bedb55172adfb911ae08e047c3827c6082c2	no	38
Warnings:					
Information:					
15	Non Patent Literature	Exhibit_1023_IETF_RFC_3198.pdf	999731 38a53520c3938157fd343a64edd9ddd4201ba463	no	19
Warnings:					
Information:					

16	Non Patent Literature	Exhibit_1031_IETF_RFC_4745.pdf	1099392 cb50a99428b44600a1d090253efbbe1188df4c01	no	32
Warnings:					
Information:					
17	Non Patent Literature	Exhibit_1021_IETF_RFC_791.pdf	1487406 39f3d38959baa2525e757ce01030479d9cbf28d2	no	45
Warnings:					
Information:					
18	Non Patent Literature	Exhibit_1029_Model-View-Controller.pdf	790377 3cfbe998dc78746e430c8966abba116482be6a81	no	9
Warnings:					
Information:					
19	Non Patent Literature	Exhibit_1032_Samsung_Stipulation_letter_regarding_IPR_grounds_in_District_court_litigation.pdf	1041906 3822b017513b8aa19b37dc4dc2429605ab24d19d	no	4
Warnings:					
Information:					
20	Non Patent Literature	Exhibit_1016_Samsung_Stipulation_letter_regarding_IPR_grounds_in_District_court_litigation.pdf	1067083 792f6a39472041888c4f5b3e7228f03f1134c65e	no	4
Warnings:					
Information:					
21	Non Patent Literature	Exhibit_1034_Shuler_How_Does_the_Internet_Work.pdf	912080 5ae370ec7471b5b7c2179e8f51dfb41128fa23e5	no	13
Warnings:					
Information:					
22	Non Patent Literature	Exhibit_1021_Stevens_Unix_Networking_Programming_Vol_1_3rd_Edition.pdf	3540967 531afe79e29f4484ff2e90d860e0be8357cfe74c	no	14
Warnings:					
Information:					

23	Non Patent Literature	Exhibit_1013_Tanenbaum_Excepts_Computer_Networks.pdf	15171077 9bd091b9554301a36d508b58637d79ca831cfb2c	no	8
Warnings:					
Information:					
24	Non Patent Literature	Exhibit_1011_TCP_IP_Illustrated_Volume_1.pdf	7755776 0b1112b662aa55e79cdc384ca9d03230a87451f7	no	5
Warnings:					
Information:					
25	Non Patent Literature	Exhibit_1024_USB720_Modem_Hardware_User_Manual.pdf	6092556 084efa0854619dad17ea3b2b422bf1afc97fd62a	no	20
Warnings:					
Information:					
26	Non Patent Literature	Exhibit_1032_Want_When_Cell_Phones_Become_Computers.pdf	4637500 4365fb109e7e559e3550a3062211c41d913496da	no	4
Warnings:					
Information:					
27	Non Patent Literature	Exhibit_1022_Welsh_Memory_management_for_user-level_network_interfaces.pdf	927970 db8a862eec76e35aef5cf7c490030a88cf4b6b89	no	10
Warnings:					
Information:					
		Total Files Size (in bytes):	116798501		

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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/08a (01-22)
Approved for use through 05/31/2024. 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	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	N/A
	Examiner Name	NOT YET ASSIGNED
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	8713667	B2	2014-04-29	Kalibjian et al.	
	2	5987611	A	1999-11-16	Freund	
	3	6947723	B1	2005-09-20	Gurnani et al.	
	4	7924730	B1	2011-04-12	McAllister et al.	
	5	9277445	B2	2016-03-01	Raleigh et al.	
	6					
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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	N/A
	Examiner Name	NOT YET ASSIGNED
	Attorney Docket Number	RALEP037D1C1C1C1C1

	1	20050037740	A1	2005-02-17	Smith et al.	
	2	20060039354	A1	2006-02-23	Rao et al.	
	3	20080080458	A1	2008-04-03	Cole	
	4	20090119773	A1	2009-05-07	D'AMORE et al.	
	5	20100115048	A1	2010-05-06	Scahill	
	6	20080057894	A1	2008-03-06	Aleksic	

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]	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	1484871	EP	A1	2004-12-08	Kelz et al.		☐

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]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	N/A
	Examiner Name	NOT YET ASSIGNED
	Attorney Docket Number	RALEP037D1C1C1C1C1

	1	IPR2023-01157: Petition for Inter Partes Review of United States Patent No. 11,405,224, filed July 20, 2023.	☐
	2	IPR2023-01226: Petition for Inter Partes Review of United States Patent No. 10,237,773, filed July 21, 2023.	☐
	3	Complaint filed in Headwater Research LLC v. Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., dated October 26, 2022, Case No. 2:22-cv-00422, E.D. Texas.	☐
	4	First Amended Complaint filed in Headwater Research LLC v. Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., dated November 30, 2022, Case No. 2:22-cv-00422, E.D. Texas.	☐
	5	Complaint filed in Headwater Research LLC v. Samsung Electronics Co., Ltd. et al., dated December 6, 2022, Case No. 2:22-cv-00467, E.D. Texas.	☐
	6	File History of U.S. Patent No. 9,277,445 (Raleigh et al.), issued March 1, 2016	☐
	7	File History of IPR2023-01157, filed July 20, 2023.	☐
	8	File History of IPR2023-01226, filed July 21, 2023.	☐
	9	Samsung Stipulation letter, dated July 21, 2023 in Headwater Research LLC v. Samsung Electronics Co., Ltd., et al. Case No. 2:22-cv-00467, E.D. Texas	☐
	10	Samsung Stipulation letter, dated July 20, 2023 in Headwater Research LLC v. Samsung Electronics Co., Ltd., et al. Case No. 2:22-cv-00422, E.D. Texas	☐
If you wish to add additional non-patent literature document citation information please click the Add button			

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	N/A
	Examiner Name	NOT YET ASSIGNED
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	N/A
	Examiner Name	NOT YET ASSIGNED
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-07-26
Name/Print	Farshad Farjami	Registration Number	41014

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

Electronic Acknowledgement Receipt	
EFS ID:	48353147
Application Number:	17567594
International Application Number:	
Confirmation Number:	1081
Title of Invention:	Enterprise Access Control and Accounting Allocation for Access Networks
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	106963
Filer:	Michael Farjami/Evan Gunderman
Filer Authorized By:	Michael Farjami
Attorney Docket Number:	RALEP037D1C1C1C1C1
Receipt Date:	26-JUL-2023
Filing Date:	03-JAN-2022
Time Stamp:	15:07:48
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	Information Disclosure Statement (IDS) Form (SB08)	RALEP037D1C1C1C1C1_IDS_July_26_23.pdf	989272 67a80558dce26735b1de41d449d925c4448e4505	no	5

Warnings:

Information:					
This is not an USPTO supplied IDS fillable form					
2	Foreign Reference	EP1484871A1.pdf	310082 e9801c6dd02fbc08abab07f83dd67bd09aa1db3f	no	15
Warnings:					
Information:					
3	Non Patent Literature	IPR2023-01157_Petition_for_Inter_Partes_Review.pdf	5708690 b5fc5c4e3c56487868f220daebad06dd20359c4c	no	101
Warnings:					
Information:					
4	Non Patent Literature	IPR2023-01226_Petition_for_Inter_Partes_Review.pdf	5188083 7fd27e2f396f012a65874b31fed1d551d30851c7	no	103
Warnings:					
Information:					
5	Non Patent Literature	Samsung_10_26.pdf	1532702 6f0fab90f486f846254f6c91c5ccd1559a835ac3	no	23
Warnings:					
Information:					
6	Non Patent Literature	Samsung_First_Amended.pdf	1811451 96725e85fb69a06b0433190003d12651cc31c6a8	no	29
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Information:					
7	Non Patent Literature	Exhibit_1004_Complaint.pdf	1621076 0d0b0d644606d2bb22855944e7c0348900180e9a	no	26
Warnings:					
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8	Non Patent Literature	Samsung_1016_July_21_23.pdf	329790 79eefc33a6e545cfd34feb5222b5e681d498329b	no	4
Warnings:					
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9	Non Patent Literature	Samsung_1016_July_20_23.pdf	329766 49e9b16d2d41d324ad7b084063ba6ed92ce51fae	no	4
Warnings:					
Information:					
			Total Files Size (in bytes):	17820912	

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New Applications Under 35 U.S.C. 111

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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.

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

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	OPAP
	Examiner Name	NOT YET ASSIGNED
	Attorney Docket Number	RALEP037D1C1C1C1C1

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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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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	101437224	CN	A	2009-05-20	Yang et al.		
	2	2381711	EP	A1	2011-10-26	Yang et al.		

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	OPAP
	Examiner Name	NOT YET ASSIGNED
	Attorney Docket Number	RALEP037D1C1C1C1C1

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		Date Considered	

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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	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	OPAP
	Examiner Name	NOT YET ASSIGNED
	Attorney Docket Number	RALEP037D1C1C1C1C1

CERTIFICATION STATEMENT

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

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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	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-07-07
Name/Print	Farshad Farjami	Registration Number	41014

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.**

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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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Electronic Acknowledgement Receipt	
EFS ID:	48266185
Application Number:	17567594
International Application Number:	
Confirmation Number:	1081
Title of Invention:	Enterprise Access Control and Accounting Allocation for Access Networks
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	106963
Filer:	Michael Farjami/Evan Gunderman
Filer Authorized By:	Michael Farjami
Attorney Docket Number:	RALEP037D1C1C1C1C1
Receipt Date:	07-JUL-2023
Filing Date:	03-JAN-2022
Time Stamp:	17:42:59
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	Information Disclosure Statement (IDS) Form (SB08)	RALEP037D1C1C1C1C1_IDS.pdf	1282248 02aafa2ca2b8d302aa2a1aef389b3b25bce11e15	no	4

Warnings:

Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Foreign Reference	CN101437224.pdf	978722 16cf8e4636549f97740c2108868deb28a562f260	no	29
Warnings:					
Information:					
3	Foreign Reference	EP2381711A1.pdf	384495 8c69dc168e5399519832e0f6cf2035f6ce25c042	no	13
Warnings:					
Information:					
			Total Files Size (in bytes):	2645465	

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/08a (01-22)
Approved for use through 05/31/2024. 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	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	3687
	Examiner Name	
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	9137744	B2	2015-09-15	Scherzer, et al	
	2	8565766	B2	2013-10-22	Scherzer, et al	
	3					
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	20040098610	A1	2004-05-20	Hrastar	
	2	20070259673	A1	2007-11-08	Willars et al.	
	3	20080162637	A1	2008-07-03	Adamczyk et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2022-01-03
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	Art Unit	3687
	Examiner Name	
	Attorney Docket Number	RALEP037D1C1C1C1C1

	4	20080318547	A1	2008-12-25	Ballou JR. et al.	
	5	20090257379	A1	2009-10-15	Robinson et al.	
	6	20100082431	A1	2010-04-01	Ramer et al.	
	7	20180262947	A1	2018-09-13	Raleigh et al.	
	8	20140080539	A1	2015-09-15	Scherzer, et al	

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]	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	101911772	CN	A	2010-12-08	Evans, G		☐
	2	101114878	CN	A	2008-01-13	Brima I		☐

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]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	3687
	Examiner Name	
	Attorney Docket Number	RALEP037D1C1C1C1C1

	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	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	3687
	Examiner Name	
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	/Farshad Farjami/	Date (YYYY-MM-DD)	2023-05-23
Name/Print	Farshad Farjami	Registration Number	41014

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

Electronic Acknowledgement Receipt	
EFS ID:	48048856
Application Number:	17567594
International Application Number:	
Confirmation Number:	1081
Title of Invention:	Enterprise Access Control and Accounting Allocation for Access Networks
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	106963
Filer:	Michael Farjami/Evan Gunderman
Filer Authorized By:	Michael Farjami
Attorney Docket Number:	RALEP037D1C1C1C1C1
Receipt Date:	23-MAY-2023
Filing Date:	03-JAN-2022
Time Stamp:	20:56:43
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		RALEP037D1C1C1C1C1_IDS_May_23_23.pdf	18321949 040e1d554f85d5da0f5dd713d7bdbd9d9137b5a1	yes	61

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Information Disclosure Statement (IDS) Form (SB08)	1	4
	Non Patent Literature	5	17
	Non Patent Literature	18	61
Warnings:			
Information:			
	Total Files Size (in bytes):	18321949	

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<u>National Stage of an International Application under 35 U.S.C. 371</u>
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<u>New International Application Filed with the USPTO as a Receiving Office</u>
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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/567,594	01/03/2022	Gregory G. Raleigh	RALEP037D1C1C1C1C1

CONFIRMATION NO. 1081

106963
Headwater Research LLC
C/O Farjami & Farjami LLP
26522 La Alameda Ave., Suite 360
Mission Viejo, CA 92691

PUBLICATION NOTICE

OC000000135473508

Title: Enterprise Access Control and Accounting Allocation for Access Networks

Publication No.US-2022-0240329-A1
Publication Date:07/28/2022

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 Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently https://portal.uspto.gov/pair/PublicPair. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

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

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/567,594	01/03/2022	Gregory G. Raleigh	RALEP037D1C1C1C1C1

CONFIRMATION NO. 1081

106963
Headwater Research LLC
110 North College Avenue
Suite 1116
Tyler, TX 75702

POA ACCEPTANCE LETTER

OC000000133204937

Date Mailed: 04/19/2022

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/14/2022.

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.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/agizaw/

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 17/567,594

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	80		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	350		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	400		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	1 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 240 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 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).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	830		TOTAL	

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($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
17/567,594	01/03/2022		910	RALEP037D1C1C1C1C1	1	1

CONFIRMATION NO. 1081

UPDATED FILING RECEIPT

106963
Headwater Research LLC
110 North College Avenue
Suite 1116
Tyler, TX 75702

OC000000133243676

Date Mailed: 04/19/2022

Receipt is acknowledged of this non-provisional utility 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 FIRST INVENTOR, 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 corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

Gregory G. Raleigh, Incline Village, NV;
Alireza Raissinia, Saratoga, CA;
Jeffrey Green, Sunnyvale, CA;

Applicant(s)

Headwater Research LLC, Tyler, TX;

Assignment For Published Patent Application

Headwater Research LLC, Tyler, TX

Power of Attorney: The patent practitioners associated with Customer Number 106963

Domestic Priority data as claimed by applicant

This application is a CON of 16/740,625 01/13/2020 PAT 11219074
which is a CON of 16/132,643 09/17/2018 PAT 10536983
which is a CON of 15/287,603 10/06/2016 PAT 10080250
which is a CON of 14/578,124 12/19/2014 PAT 9565707
which is a DIV of 13/248,028 09/28/2011 PAT 8924469
which claims benefit of 61/387,243 09/28/2010
and is a CIP of 12/380,778 03/02/2009 PAT 8321526
and is a CIP of 12/380,780 03/02/2009 PAT 8839388
and said 12/380,778 03/02/2009
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 said 12/380,780 03/02/2009
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

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 01/13/2022

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/567,594**

Projected Publication Date: 07/28/2022

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

Enterprise Access Control and Accounting Allocation for Access Networks

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

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 (1-866-999-4258).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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Document Code:WFEE

User :C44171

Sale Adjustment Accounting Date:04/15/2022

Effective Date	Sale Accounting Date	Sale Item Reference Number
04/14/2022	04/15/2022	17567594

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20224EB46340830	2081	UTILITY APPL SIZE FEE PER 50 SHEETS >100	$3,360.00	DA

United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :C44171

Refund Accounting Date:04/15/2022

Effective Date	Sale Item Reference Number	Refund Total
04/14/2022	17567594	$3,360.00

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method	Account Number
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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	8495181	B2	2013-07-23	Venkatraman et al.	
	2	8495207	B2	2013-07-23	Lee	
	3	8495227		2013-07-23	Kaminsky, David L. et al.	
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	5	8495700	B2	2013-07-23	Shahbazi	
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	119	8719423	B2	2014-05-06	Wyld	
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	229	9438642	B2	2016-09-06	Alberth Jr. et al.	
	230	9479917	B1	2016-10-25	Gota et al.	
	231	9491199	B2	2016-11-08	Raleigh et al.	
	232	9501803	B2	2016-11-22	Bilac et al.	
	233	9516456	B2	2016-12-06	Stephens et al.	
	234	9525992	B2	2016-12-20	Rao et al.	
	235	9534861	B1	2017-01-03	Kellgren	
	236	9544397	B2	2017-01-10	Raleigh et al.	
	237	9557889	B2	2017-01-31	Raleigh et al.	
	238	9560108	B2	2017-01-31	Salkintzis	
	239	9589117	B2	2017-03-07	Ali et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	240	9609459	B2	2017-03-28	Raleigh, Gregory G.	
	241	9609510	B2	2017-03-28	Raleigh et al.	
	242	9609544	B2	2017-03-28	Raleigh et al.	
	243	9615192	B2	2017-04-04	Raleigh	
	244	9634850	B2	2017-04-25	Taft et al.	
	245	9642004	B2	2017-05-02	Wang et al.	
	246	9648022	B2	2017-05-09	Peterka et al.	
	247	9673996	B1	2017-06-06	Upadhyay et al.	
	248	9680658	B2	2017-06-13	Goel et al.	
	249	9681003	B1	2017-06-13	KIM et al.	
	250	9691082	B1	2017-06-27	Burnett et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	251	9712443	B1	2017-07-18	Phaal	
	252	9712476	B2	2017-07-18	Boynton et al.	
	253	9749899	B2	2017-08-29	Raleigh et al.	
	254	9755842	B2	2017-09-05	Raleigh et al.	
	255	9766873	B2	2017-09-19	Steigleder	
	256	9852426	B2	2017-12-26	Bacastow	
	257	9923790	B2	2018-03-20	Patel et al.	
	258	9942796	B2	2018-04-10	Raleigh	
	259	9954975	B2	2018-04-24	Raleigh et al.	
	260	9986413	B2	2018-05-29	Raleigh	
	261	RE44412		2013-08-06	Naqvi et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

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U.S.PATENT APPLICATION PUBLICATIONS Remove

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					

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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]
	1							

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

NON-PATENT LITERATURE DOCUMENTS Remove

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.

[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	17567594
	Filing Date	2022-01-03
	First Named Inventor	RALEIGH, GREGORY
	Art Unit	
	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

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	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
Name/Print	James E. Harris	Registration Number	40013

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

Privacy Act Statement

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

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

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

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

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

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

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

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

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:	17567594
Filing Date:	03-Jan-2022
Title of Invention:	Enterprise Access Control and Accounting Allocation for Access Networks
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Filer:	James E. Harris/Jennifer Smith
Attorney Docket Number:	RALEP037D1C1C1C1C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	80	80
UTILITY SEARCH FEE	2111	1	350	350
UTILITY EXAMINATION FEE	2311	1	400	400
Pages:				
UTILITY APPL SIZE FEE PER 50 SHEETS >100	2081	16	210	3360
Claims:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	2051	1	80	80

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	110	110
Miscellaneous:				
		Total in USD ($)		**4380**

Electronic Acknowledgement Receipt	
EFS ID:	45481433
Application Number:	17567594
International Application Number:	
Confirmation Number:	1081
Title of Invention:	Enterprise Access Control and Accounting Allocation for Access Networks
First Named Inventor/Applicant Name:	Gregory G. Raleigh
Customer Number:	106963
Filer:	James E. Harris/Jennifer Smith
Filer Authorized By:	James E. Harris
Attorney Docket Number:	RALEP037D1C1C1C1C1
Receipt Date:	14-APR-2022
Filing Date:	03-JAN-2022
Time Stamp:	23:57:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$4380
RAM confirmation Number	E20224DN58342823
Deposit Account	505876
Authorized User	Jennifer Smith
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 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	Assignee showing of ownership per 37 CFR 3.73	373_Statement.pdf	120026 6a1f05bd43f2825e142c91142c2622054c28012a	no	3
Warnings:					
Information:					
2	Extension of Time	P037_EOT.pdf	199900 f56a45d77ba4cdedcc2245d9dd931dd8546a5b05	no	2
Warnings:					
Information:					
3	Power of Attorney	POA.pdf	52895 e555bb6439c91942e709cbc360a601bbbc3191a6	no	1
Warnings:					
Information:					
4	Transmittal Letter	IDS_Transmittal_Letter.pdf	64771 56ee40dd3c86c407dce4a5a0a38af4bbe30e997f	no	2
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	RALEP037D1C1C1C1C1_1_OF_6.pdf	1294340 93ffc33e441a088ea2fa6b01ccd99805d33b81da	no	40
Warnings:					
Information:					
6	Information Disclosure Statement (IDS) Form (SB08)	RALEP037D1C1C1C1C1_2_OF_6.pdf	1291946 b799e03c2f880502b461cffffac3f4651a26ba03	no	37
Warnings:					
Information:					

7	Information Disclosure Statement (IDS) Form (SB08)	RALEP037D1C1C1C1C1_3_OF_6.pdf	1289462 e2157e19718143d35d9332605b459da349add90a	no	31
Warnings:					
Information:					
8	Information Disclosure Statement (IDS) Form (SB08)	RALEP037D1C1C1C1C1_4_OF_6.pdf	1289087 6af5c5302ce05eedfeafa4636f3f4a1379be54bf	no	31
Warnings:					
Information:					
9	Information Disclosure Statement (IDS) Form (SB08)	RALEP037D1C1C1C1C1_5_OF_6.pdf	1288844 343fbd33443e179c9bca67359b52b3bfcddb1793	no	31
Warnings:					
Information:					
10	Information Disclosure Statement (IDS) Form (SB08)	RALEP037D1C1C1C1C1_6_OF_6.pdf	1287669 15221ad4e7f7a19046f66a2d313ff1497dee4661	no	27
Warnings:					
Information:					
11	Fee Worksheet (SB06)	fee-info.pdf	51365 60c2b7126a36b1d2331bbd5833607a126618c982	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	8230305		

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/AIA/96 (08-12)
Approved for use through 01/31/2013. 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(c)

Applicant/Patent Owner: Headwater Research LLC

Application No./Patent No.: 17/567,594 Filed/Issue Date: 01/03/2022

Titled: Enterprise Access Control and Accounting Allocation for Access Networks

Headwater Research LLC, a limited liability company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

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 _____, Frame _____, or for which a copy thereof is attached.

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

1. From: Inventors (Raleigh, Raissinia, Green) To: Headwater Partners I LLC

   The document was recorded in the United States Patent and Trademark Office at Reel 059215, Frame 0742, or for which a copy thereof is attached.

2. From: Headwater Partners I LLC To: Headwater Research LLC

   The document was recorded in the United States Patent and Trademark Office at Reel 059215, Frame 0752, or for which a copy thereof is attached.

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

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

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
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STATEMENT UNDER 37 CFR 3.73(c)

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.

4. 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.

5. 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.

6. 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(c)(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.

/James E. Harris/	April 14, 2022
Signature	Date
James E. Harris	40013
Printed or Typed Name	Title or Registration Number

[Page 2 of 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).
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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)).
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.

PTO/SB/22 (10-20)
Approved for use through 11/30/2020. 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.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): P037D1C1C1C1C1

Application Number: 17/567,594

Filed: 2022-01-03

For: Enterprise Access Control and Accounting Allocation for Access Network

Art Unit:

Examiner: not yet assigned

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	Micro Entity Fee	
☑ One month (37 CFR 1.17(a)(1))	$220	$110	$55	$ 110
☐ Two months (37 CFR 1.17(a)(2))	$640	$320	$160	$
☐ Three months (37 CFR 1.17(a)(3))	$1,480	$740	$370	$
☐ Four months (37 CFR 1.17(a)(4))	$2,320	$1,160	$580	$
☐ Five months (37 CFR 1.17(a)(5))	$3,160	$1,580	$790	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ 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 505876.

☐ Payment made via EFS-Web.

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. 37 CFR 3.73(b) statement is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration number 40013.

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

/James E. Harris/ — Signature

April 14, 2022 — Date

JAMES E. HARRIS — Typed or printed name

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

Application Number	17567594
Filing Date	2022-01-03
First Named Inventor	RALEIGH, GREGORY
Art Unit	
Examiner Name	not yet assigned
Attorney Docket Number	RALEP037D1C1C1C1C1

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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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The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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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	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
Name/Print	James E. Harris	Registration Number	40013

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	53	8135392		2012-03-13	MARCELLINO et al.	
	54	8135657		2012-03-13	Kapoor, Harsh et al.	
	55	8140690	B2	2012-03-20	Ly et al.	
	56	8144591		2012-03-27	GHAI et al.	
	57	8144853	B1	2012-03-27	Aboujaoude et al.	
	58	8145194	B2	2012-03-27	Yoshikawa et al.	
	59	8146142	B2	2012-03-27	Lortz et al.	
	60	8149748	B2	2012-04-03	Bata et al.	
	61	8149771	B2	2012-04-03	Khivesara et al.	
	62	8149823		2012-04-03	Turcan, Diane Brown et al.	
	63	8150394	B2	2012-04-03	Bianconi et al.	

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	64	8150431		2012-04-03	Wolovitz, Lionel et al.	
	65	8151205	B2	2012-04-03	Follmann et al.	
	66	8152246	B2	2012-04-10	Miller et al.	
	67	8155155		2012-04-10	Chow, Albert T. et al.	
	68	8155620		2012-04-10	Wang, Jun et al.	
	69	8155666	B2	2012-04-10	Alizadeh-Shabdiz, Farshid	
	70	8155670		2012-04-10	Fullam, Scott et al.	
	71	8156206		2012-04-10	KILEY, Kevin J. et al.	
	72	8159520	B1	2012-04-17	Dhanoa et al.	
	73	8160015		2012-04-17	RASHID, Mohammed H. et al.	
	74	8160056	B2	2012-04-17	Van der Merwe et al.	

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	75	8160554	B2	2012-04-17	Gosselin et al.	
	76	8160555	B2	2012-04-17	Gosselin et al.	
	77	8160556	B2	2012-04-17	Gosselin et al.	
	78	8160598	B2	2012-04-17	Savoor, Raghvendra	
	79	8165576		2012-04-24	Raju, Vishwanath et al.	
	80	8166040	B2	2012-04-24	Brindisi, Richard G. et al.	
	81	8166554	B2	2012-04-24	John, Pramod	
	82	8170553		2012-05-01	BENNETT, James D.	
	83	8174378	B2	2012-05-08	Richman et al.	
	84	8174970	B2	2012-05-12	Adamczyk, Maria et al.	
	85	8175574	B1	2012-05-08	Panda et al.	

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	86	8175966	B2	2012-05-08	Steinberg et al.	
	87	8180333	B1	2012-05-15	Wells et al.	
	88	8180881	B2	2012-05-15	Seo et al.	
	89	8180886	B2	2012-05-15	Overcash et al.	
	90	8184530		2012-05-22	SWAN, Tim L. et al.	
	91	8184590		2012-05-22	Rosenblatt, Ariel	
	92	8185088	B2	2012-05-22	Klein et al.	
	93	8185093		2012-05-22	Jheng, Yu-Syuan et al.	
	94	8185127	B1	2012-05-22	Cai et al.	
	95	8185152		2012-05-22	GOLDNER, Alla	
	96	8185158		2012-05-22	Tamura, Motoshi et al.	

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	97	8190087	B2	2012-05-29	Fisher et al.	
	98	8190122	B1	2012-05-29	Alexander et al.	
	99	8190675		2012-05-29	TRIBBETT, David	
	100	8191106	B2	2012-05-29	Choyi et al.	
	101	8191116		2012-05-29	Gazzard, Daryl	
	102	8191124	B2	2012-05-29	Wynn et al.	
	103	8194549	B2	2012-06-05	Huber et al.	
	104	8194553		2012-06-05	LIANG, Zhi Yong et al.	
	105	8194572	B2	2012-06-05	Horvath et al.	
	106	8194581	B1	2012-06-05	Schroeder et al.	
	107	8195093	B2	2012-06-05	Garrett et al.	

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	108	8195153	B1	2012-06-05	Frencel et al.	
	109	8195163	B2	2012-06-05	Gisby, Doug et al.	
	110	8195661	B2	2012-06-05	Kalavade, Asawaree	
	111	8196182	B2	2012-06-05	Sussland et al.	
	112	8196199	B2	2012-06-05	Hrastar et al.	
	113	8200163	B2	2012-06-12	Hoffman, George E.	
	114	8200200	B1	2012-06-12	Belser et al.	
	115	8200509	B2	2012-06-12	Kenedy, Andrew Alexander et al.	
	116	8200775		2012-06-12	MOORE, James F.	
	117	8200818	B2	2012-06-12	Freund et al.	
	118	8204190	B2	2012-06-19	Bang et al.	

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	119	8204505	B2	2012-06-19	Jin et al.	
	120	8204794		2012-06-19	Peng, Shih-Ta et al.	
	121	8208788	B2	2012-06-26	Ando et al.	
	122	8208919		2012-06-26	KOTECHA, Lalit Ratilal	
	123	8213296		2012-07-03	SHANNON, Frank M. et al.	
	124	8213363		2012-07-03	Ying, Wen-Ping et al.	
	125	8214536		2012-07-03	ZHAO, Wen	
	126	8214890	B2	2012-07-03	Kirovski et al.	
	127	8219134	B2	2012-07-10	Maharajh et al.	
	128	8219821	B2	2012-07-10	Zimmels et al.	
	129	8223655	B2	2012-07-17	Heinz et al.	

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	130	8223741	B	2012-07-17	Bartlett et al.	
	131	8224382		2012-07-17	Bultman, Michael J.	
	132	8224773		2012-07-17	Spiegel, Joel R.	
	133	8228818	B2	2012-07-24	Chase et al.	
	134	8229394	B2	2012-07-24	Karlberg, Johan	
	135	8229914	B2	2012-07-24	Ramer et al.	
	136	8230061		2012-07-24	Hassan, Amer A. et al.	
	137	8233433	B2	2012-07-31	Kalhan, Amit	
	138	8233878	B2	2012-07-31	Gosnell et al.	
	139	8233883		2012-07-31	De Froment, Eric	
	140	8233895		2012-07-31	Tysowski, Piotr Konrad	

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	141	8234583	B2	2012-07-31	Sloo et al.	
	142	8238287		2012-08-07	Gopi, Paramesh et al.	
	143	8238913	B1	2012-08-07	Bhattacharyya et al.	
	144	8239520		2012-08-07	GRAH, Adrian	
	145	8242959	B2	2012-08-14	Mia, Rashidus S. et al.	
	146	8244241		2012-08-14	Montemurro, Michael	
	147	8249601	B2	2012-08-21	Emberson et al.	
	148	8254880	B2	2012-08-28	Aaltonen et al.	
	149	8254915		2012-08-28	Kozisek, Steven E.	
	150	8255515		2012-08-28	MELMAN, David et al.	
	151	8255534	B2	2012-08-28	Assadzadeh, Alireza	

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	152	8255689		2012-08-28	KIM, Eun Ah et al.	
	153	8259692	B2	2012-09-04	Bajko, Gabor	
	154	8260252	B2	2012-09-04	Agarwal	
	155	8264965	B2	2012-09-11	Dolganow et al.	
	156	8265004		2012-09-11	Toutonghi, Michael J.	
	157	8266249	B2	2012-09-11	Hu	
	158	8266269	B2	2012-09-11	Short et al.	
	159	8266681		2012-09-11	Deshpande, Sumit B. et al.	
	160	8270955	B2	2012-09-18	Ramer et al.	
	161	8270972	B2	2012-09-18	Otting, Marcia J. et al.	
	162	8271025	B2	2012-09-18	Brisebois et al.	

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	163	8271045		2012-09-18	Parolkar, Satish et al.	
	164	8271049		2012-09-18	SILVER, Andrew et al.	
	165	8271992	B2	2012-09-18	Chatley, Scott P. et al.	
	166	8275415	B2	2012-09-25	Huslak, Nicholas S.	
	167	8275830	B2	2012-09-25	Raleigh	
	168	8279067		2012-10-02	BERGER, Thomas R. et al.	
	169	8279864		2012-10-02	Wood, Daniel M.	
	170	8280351		2012-10-02	Ahmed, Shahid et al.	
	171	8280354		2012-10-02	Smith, Christopher et al.	
	172	8284740		2012-10-09	O'CONNOR, Dennis M.	
	173	8285249	B2	2012-10-09	Baker, Matthew Donald et al.	

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	174	8285992	B2	2012-10-09	Mathur et al.	
	175	8290820	B2	2012-10-16	Plastina et al.	
	176	8291238		2012-10-16	GINTER, Karl L. et al.	
	177	8291439	B2	2012-10-16	Jethi et al.	
	178	8296404		2012-10-23	McDysan, Dave et al.	
	179	8300575	B2	2012-10-30	Willars, Per	
	180	8301513		2012-10-30	Peng, Shih-Ta et al.	
	181	8306505	B2	2012-11-06	Bennett	
	182	8306518		2012-11-06	GAILLOUX, Michael A.	
	183	8306741	B2	2012-11-06	Tu, Ihung	
	184	8307067	B2	2012-11-06	Ryan, Nicholas M.	

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	185	8307095	B2	2012-11-06	Clark et al.	
	186	8310943	B2	2012-11-13	Mehta et al.	
	187	8315198	B2	2012-11-20	Corneille et al.	
	188	8315593	B2	2012-11-20	Gallant et al.	
	189	8315594		2012-11-20	Mauser, Edward Ronald et al.	
	190	8315718		2012-11-20	Caffrey, Paul Oliver et al.	
	191	8315999	B2	2012-11-20	Chatley, Scott P. et al.	
	192	8320244	B2	2012-11-27	Muqattash et al.	
	193	8320902	B2	2012-11-27	Moring et al.	
	194	8320949		2012-11-27	Matta, Sudheer Poorna Chandra	
	195	8325638		2012-12-04	Jin, Haipeng et al.	

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	196	8325906	B2	2012-12-04	Fullarton et al.	
	197	8326319	B2	2012-12-04	Davis, Richard W.	
	198	8326359		2012-12-04	Kauffman, Donald C.	
	199	8326828	B2	2012-12-04	Zhou et al.	
	200	8331223	B2	2012-12-11	Hill et al.	
	201	8331293		2012-12-11	Sood, Kapil	
	202	8332375		2012-12-11	Chatley, Scott P. et al.	
	203	8332517		2012-12-11	Russell, Jesse E.	
	204	8335161		2012-12-18	Foottit, Tom et al.	
	205	8339991	B2	2012-12-25	Biswas et al.	
	206	8340625	B1	2012-12-25	Johnson et al.	

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	207	8340628	B2	2012-12-25	Taylor et al.	
	208	8340644	B2	2012-12-25	Sigmund et al.	
	209	8340678	B1	2012-12-25	Pandey, Vinod	
	210	8340718		2012-12-25	Colonna, Massimo et al.	
	211	8346023	B2	2013-01-01	Lin	
	212	8346210	B2	2013-01-01	Balsan et al.	
	213	8346225	B2	2013-01-01	Raleigh	
	214	8346923	B2	2013-01-01	Rowles et al.	
	215	8347104	B2	2013-01-01	Pathiyal, Krishna K.	
	216	8347362		2013-01-01	Cai, Yigang et al.	
	217	8347378	B2	2013-01-01	Merkin et al.	

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	218	8350700		2013-01-08	Fast, Raymond D. et al.	
	219	8351592	B2	2013-01-08	Freeny Jr et al.	
	220	8351898	B2	2013-01-08	Raleigh	
	221	8352360	B2	2013-01-08	De Judicibus et al.	
	222	8352630		2013-01-08	Hart, Justin Scott	
	223	8352980		2013-01-08	Howcroft, Jerald Robert	
	224	8353001		2013-01-08	Herrod, Allan	
	225	8355570	B2	2013-01-15	Karsanbhai et al.	
	226	8355696	B1	2013-01-15	Olding et al.	
	227	8356336	B2	2013-01-15	Johnston, Keith et al.	
	228	8358638	B2	2013-01-22	Scherzer, Tamir et al.	

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	229	8358975	B2	2013-01-22	Bahl et al.	
	230	8363658		2013-01-29	Delker, Jason R. et al.	
	231	8363799	B2	2013-01-29	Gruchala et al.	
	232	8364089		2013-01-29	PHILLIPS, Derek	
	233	8364806		2013-01-29	Short, Joel E. et al.	
	234	8369274	B2	2013-02-05	Sawai, Ryo	
	235	8370477		2013-02-05	Short, Joel E. et al.	
	236	8370483	B	2013-02-05	Choong Jason et al.	
	237	8374090		2013-02-12	Morrill, Robert J. et al.	
	238	8374102	B2	2013-02-12	Luft et al.	
	239	8374592		2013-02-12	Proctor, Jr. James A. et al.	

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	240	8375128	B2	2013-02-12	Tofighbakhsh et al.	
	241	8375136	B2	2013-02-12	Roman et al.	
	242	8379847		2013-02-19	Bell, Robert H. et al.	
	243	8380247	B2	2013-02-19	Engstrom	
	244	8380804	B2	2013-02-19	JAIN et al.	
	245	8385199	B1	2013-02-26	Coward et al.	
	246	8385896		2013-02-26	Proctor Jr., James A. et al.	
	247	8385964	B2	2013-02-26	Haney, Richard D.	
	248	8385975	B2	2013-02-26	Forutanpour et al.	
	249	8386386		2013-02-26	Zhu, Kevin	
	250	8391262	B2	2013-03-05	Maki et al.	

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	251	8391834	B2	2013-03-05	Raleigh	
	252	8392982	B2	2013-03-05	Harris et al.	
	253	8396458	B	2013-03-12	Raleigh, Gregory G.	
	254	8396929		2013-03-12	Helfman, Nadav et al.	
	255	8397083	B1	2013-03-12	Sussland et al.	
	256	8401906	B2	2013-03-19	Ruckart	
	257	8401968	B1	2013-03-19	Schattauer et al.	
	258	8402165	B2	2013-03-19	Deu-Ngoc et al.	
	259	8402540		2013-03-19	Kapoor, Harsh et al.	
	260	8406427		2013-03-26	Chand, Naresh et al.	
	261	8406736	B2	2013-03-26	Das et al.	

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	262	8406756	B1	2013-03-26	Reeves et al.	
	263	8407472	B2	2013-03-26	Hao et al.	
	264	8407763	B2	2013-03-26	Weller et al.	
	265	8411587		2013-04-02	Curtis, William et al.	
	266	8411691	B2	2013-04-02	Aggarwal	
	267	8412798	B1	2013-04-02	Wang, Frank C.	
	268	8413245	B2	2013-04-02	Kraemer et al.	
	269	8418168	B2	2013-04-09	Tyhurst et al.	
	270	8422988		2013-04-16	KESHAV, Srinivasan	
	271	8423016		2013-04-16	BUCKLEY, Adrian et al.	
	272	8429403		2013-04-23	Moret, Eric et al.	

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	273	8437734		2013-05-07	Ray, Amar N. et al.	
	274	8441955	B2	2013-05-14	Wilkinson Robert et al.	
	275	8442015	B2	2013-05-14	Behzad et al.	
	276	8442507	B2	2013-05-14	Duggal et al.	
	277	8443390	B2	2013-05-14	Lo et al.	
	278	8446831	B2	2013-05-21	Kwan et al.	
	279	8447324		2013-05-21	Shuman, Mohammed Ataur et al.	
	280	8447607	B2	2013-05-21	Weider, Chris et al.	
	281	8447980		2013-05-21	Godfrey, James A. et al.	
	282	8448015	B2	2013-05-21	Gerhart, David	
	283	8452858	B2	2013-05-28	Wu et al.	

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	284	8457603	B2	2013-06-04	EL-KADRI et al.	
	285	8461958	B2	2013-06-11	Saenz et al.	
	286	8463194	B2	2013-06-11	Erlenback et al.	
	287	8463232	B2	2013-06-11	Tuli et al.	
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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).

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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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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.

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	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

	174	7133907	B2	2006-11-07	Carlson et al.	
	175	7136361	B2	2006-11-14	Benveniste, Mathilde	
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	179	7149521	B2	2006-12-12	Sundar et al.	
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	185	7171199	B1	2007-01-30	Rahman	
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	Examiner Name	not yet assigned
	Attorney Docket Number	RALEP037D1C1C1C1C1

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).

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☐ 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.

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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	/James E. Harris/	Date (YYYY-MM-DD)	2022-04-14
Name/Print	James E. Harris	Registration Number	40013

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I hereby appoint:

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OR

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

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Assignee name and address: Headwater Research LLC
1011 Pruitt Place
Tyler, TX 75703 (USA)

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

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

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Name James E. Harris	Telephone 903-201-6212
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In re Application of:	Raleigh, Gregory	Examiner:	NOT YET ASSIGNED
Serial No.:	17/567,594	Art Unit:	NOT YET ASSIGNED
Filed:	January 3, 2022	Conf. No.:	1081
Title:	Enterprise Access Control and Accounting Allocation for Access Networks		

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INFORMATION DISCLOSURE STATEMENT

The references cited on attached form PTO/SB/08A are being called to the attention of the Examiner. Copies of the references are not enclosed.

In accordance with 37 CFR §1.98(d), copies of the references can be found in related U.S. Patent Application No. 16/740,625, filed January 13, 2020, of which the instant application is a continuation, or in related U.S. Patent Application No. 16/132,643, filed on September 17, 2018, of which 16/740,625 is a continuation.

It is respectfully requested that the cited references be expressly considered during the prosecution of this application, and the references be made of record therein and appear among the "references cited" on any patent to issue therefrom.

As provided for by 37 CFR § 1.97(g) and (h), no inference should be made that the information and references cited are prior art merely because they are in this statement and no

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Applicant believes that no fee is required for submission of this statement, but if for any reason an insufficient fee has been paid, please charge the insufficiency to Deposit Account No. **50-5876**.

Respectfully submitted,

Date: April 14, 2022

By: /James E. Harris/
James E. Harris
Reg. No. 40,013
Patent Counsel
Headwater Research LLC
110 N. College Avenue, Suite 1116
Tyler, TX 75702
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	17567594
Filing Date	2022-01-03
First Named Inventor	RALEIGH, GREGORY
Art Unit	
Examiner Name	not yet assigned
Attorney Docket Number	RALEP037D1C1C1C1C1

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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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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 17/567,594

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	80		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	350		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	400		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	1 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 240 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 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).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	830		TOTAL	

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($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
17/567,594	01/03/2022		0.00	RALEP037D1C1C1C1C1	1	1

CONFIRMATION NO. 1081

106963
Headwater Research LLC
110 North College Avenue
Suite 1116
Tyler, TX 75702

FILING RECEIPT

OC000000131105253

Date Mailed: 01/14/2022

Receipt is acknowledged of this non-provisional utility 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 FIRST INVENTOR, 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 corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

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Applicant(s)

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Assignment For Published Patent Application

Headwater Research LLC, Tyler, TX

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 16/740,625 01/13/2020 PAT 11219074
which is a CON of 16/132,643 09/17/2018 PAT 10536983
which is a CON of 15/287,603 10/06/2016 PAT 10080250
which is a CON of 14/578,124 12/19/2014 PAT 9565707
which is a DIV of 13/248,028 09/28/2011 PAT 8924469
which claims benefit of 61/387,243 09/28/2010
and is a CIP of 12/380,778 03/02/2009 PAT 8321526
and is a CIP of 12/380,780 03/02/2009 PAT 8839388
and said 12/380,778 03/02/2009
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 said 12/380,780 03/02/2009
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

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 01/13/2022

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/567,594**

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

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Enterprise Access Control and Accounting Allocation for Access Networks

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/567,594	01/03/2022	Gregory G. Raleigh	RALEP037D1C1C1C1C1

CONFIRMATION NO. 1081

106963
Headwater Research LLC
110 North College Avenue
Suite 1116
Tyler, TX 75702

FORMALITIES LETTER

OC000000131105254

Date Mailed: 01/14/2022

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 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.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **80** basic filing fee.
- $ **80** surcharge.
- $ **350** search fee.
- $ **400** examination fee.
- $(**0**) previous unapplied payment amount.
- $ **910** TOTAL FEE BALANCE DUE.

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

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P.O. Box 1450
Alexandria VA 22313-1450

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/tgebre/

ENTERPRISE ACCESS CONTROL AND ACCOUNTING ALLOCATION FOR ACCESS NETWORKS

BACKGROUND

[0001] With the advent of mass market digital communications and content distribution, many access networks such as wireless networks, cable networks and DSL (Digital Subscriber Line) networks are pressed for user capacity, with, for example, EVDO (Evolution-Data Optimized), HSPA (High Speed Packet Access), LTE (Long Term Evolution), WiMax (Worldwide Interoperability for Microwave Access), and Wi-Fi (Wireless Fidelity) wireless networks increasingly becoming user capacity constrained. Although wireless network capacity will increase with new higher capacity wireless radio access technologies, such as MIMO (Multiple-Input Multiple-Output), and with more frequency spectrum being deployed in the future, these capacity gains are likely to be less than what is required to meet growing digital networking demand.

[0002] Similarly, although wire line access networks, such as cable and DSL, can have higher average capacity per user, wire line user service consumption habits are trending toward very high bandwidth applications that can quickly consume the available capacity and degrade overall network service experience. Because some components of service provider costs go up with increasing bandwidth, this trend will also negatively impact service provider profits.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] Various embodiments of the invention are disclosed in the following detailed description and the accompanying drawings.

[0004] **Figure 1** illustrates a functional diagram of a network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0005] **Figure 2** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0006] **Figure 3** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0007] **Figure 4** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0008] **Figure 5** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0009] **Figure 6** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0010] **Figure 7** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0011] **Figure 8** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0012] **Figure 9** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0013] **Figure 10** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0014] **Figure 11** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0015] **Figure 12** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0016] **Figure 13** illustrates a functional diagram of a secure device application architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0017] **Figure 14** illustrates a functional diagram of another secure device virtual machine architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0018] **Figure 15** illustrates a functional diagram of another secure device hardware execution partition architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0019] **Figure 16** illustrates a functional diagram of another secure device service processor architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0020] **Figure 17** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0021] **Figure 18** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0022] **Figure 19** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0023] **Figure 20** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0024] **Figure 21** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0025] **Figure 22** illustrates a functional diagram of another network architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0026] **Figure 23** illustrates a functional diagram of a secure device application architecture with device based service usage monitoring for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0027] **Figure 24** illustrates a functional diagram of a secure device virtual machine architecture with device based service usage monitoring for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0028] **Figure 25** illustrates a functional diagram of a secure device hardware execution partition architecture with device based service usage monitoring for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0029] **Figure 26** illustrates a functional diagram of a secure device service processor architecture with device based service usage monitoring for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0030] **Figure 27** illustrates a flow diagram for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0031] **Figure 28** illustrates another flow diagram for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0032] **Figure 29** illustrates another flow diagram for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

[0033] **Figure 30** illustrates another flow diagram for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments.

DETAILED DESCRIPTION

[0034] 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.

[0035] 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.

[0036] Some enterprises only allow certain specialized wireless devices to be used for connection to their enterprise network. Such devices typically contain secure data storage and enterprise program execution environments to protect enterprise information and network access. This approach is generally directed towards maintaining enterprise data integrity and enterprise network security. However, this approach does not address the various problems associated with

allocating service usage or billing between consumer or non-enterprise service usage activities and enterprise service usage activities.

[0037] Accordingly, there is a need to provide for an enterprise and consumer billing allocation for wireless communication device service usage activities. There is also a need to address various issues with enterprise policies that can vary from employee to employee. For example, roaming policies can be configured differently for a global sales person than for a finance administrator who does not travel as much on enterprise business. Furthermore, some enterprises may not elect to pay for employee wireless communication device purchase or all employee wireless communication service usage needs or desires. As a result, some enterprises would benefit from techniques that allowed such enterprises to piggy back on consumer device or service purchases while maintaining an enterprise and consumer billing allocation for wireless communication device service usage activities.

[0038] Also, some consumers prefer to select their own wireless communication device that may not be an enterprise approved wireless communication device or a specialized enterprise device specified by enterprise IT managers. For example, certain enterprises may only offer certain Blackberry smart phone devices, and certain employees may prefer Apple iPhone and/or various Android based smart phone devices. Another trend suggests that a growing number of enterprise employees desire to use a single wireless communication device for their enterprise mobile communication, enterprise information access, and enterprise network access as well as for, for example, their personal mobile communication, access, and application needs (e.g., consumer/personal, that is, non-enterprise, use of cellular calls, text messaging, web browsing, social networking, games, and various other service usage activities). Such dual persona devices, where a first persona is oriented to enterprise access and/or application needs and a second persona is oriented to personal access and/or application needs, are enabled by the disclosure herein.

[0039] As a result, enterprise network managers generally need a way to safely allow consumers to perform consumer mobile access services that the enterprise can specify that will not be paid for by the enterprise. Various network architectures and techniques are described herein that allow an enterprise to determine how much service usage (e.g., how much of a

corresponding service bill) should be allocated to device user services or consumer services and how much should be allocated to enterprise services in which the enterprise sponsors the enterprise access. Various design approaches and techniques are described herein for allocating enterprise and consumer billing in a secure manner that works with both specialized enterprise wireless communication devices as well as other wireless communication devices. For example, crediting a user bill with sponsored enterprise service usage is provided using various techniques described herein. As another example, providing enterprise employee reimbursement for enterprise services used on the employee wireless communication device or allowing an enterprise to deduct employee consumer service usage from their paycheck is provided using various techniques described herein. As yet another example, allowing a consumer to select from an instant activation platform on a wireless communication device that comes pre-loaded with various enterprise services is provided using various techniques described herein. As yet a further example, providing for a capability to install or download an enterprise application that provides secure enterprise mobile services access and allocating enterprise and consumer billing for consumer wireless communication devices is provided using various techniques described herein.

[0040] Various techniques for monitoring service usage and providing for secured and verifiable device assisted services (DAS), including DAS based service usage monitoring, are disclosed in co-pending U.S. Patent Application No. 12/380,758 (Attorney Docket No. RALEP003), entitled VERIFIABLE DEVICE ASSISTED SERVICE USAGE MONITORING WITH REPORTING, SYNCHRONIZATION, AND NOTIFICATION, filed on March 2, 2009, published as U.S. Pub. App. No. 20100191612, co-pending U.S. Patent Application No. 12/695,019 (Attorney Docket No. RALEP022), entitled DEVICE ASSISTED CDR CREATION, AGGREGATION, MEDIATION and BILLING, filed on January 27, 2010, published as U.S. Pub. App. No. 20100197266, co-pending U.S. Patent Application No. 12/695,020 (Attorney Docket No. RALEP024), entitled ADAPTIVE AMBIENT SERVICES, filed on January 27, 2010, published as U.S. Pub. App. No. 20100198698, co-pending U.S. Patent Application No. 12/694,445 (Attorney Docket No. RALEP025), entitled SECURITY TECHNIQUES FOR DEVICE ASSISTED SERVICES, filed on January 27, 2010, published as U.S. Pub. App. No. 20100199325, co-pending U.S. Patent Application No. 12/694,451 (Attorney Docket No. RALEP026), entitled DEVICE GROUP PARITIONS AND SETTLEMENT PLATFORM, filed

on January 27, 2010, published as U.S. Pub. App. No. 20100197267, which are incorporated herein by reference for all purposes.

[0041] In some embodiments, allocating enterprise and consumer billing for service usage activities on a wireless communication device is provided for service usage activities that an enterprise configures as approved and/or sponsored for enterprise billing (e.g., such service usage activities are paid for at least in part by the enterprise) and consumer applications and service usage activities that the device user chooses to use from the wireless communication device and that the enterprise does not sponsor. Various embodiments are disclosed herein describing a wide range of devices that users and enterprises may desire to use for such dual-purpose application scenarios. In some embodiments, devices for such applications can include a less specialized and secure device program execution environment as further described herein.

[0042] Accordingly, enterprise and consumer billing allocation for wireless communication device service usage activities is provided. In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes monitoring a service usage activity of a wireless communication device (e.g., the monitoring can be performed in the wireless communication device and/or the monitoring of enterprise application service usage can be performed using a secure application server in the enterprise network), and determining an enterprise and consumer billing allocation for the monitored service usage activity. In some embodiments the allocation is determined by classifying the service usage activities as associated with a consumer service usage activity (e.g., in a consumer service usage activity list) or associated with an enterprise service usage activity (e.g., in an enterprise service usage activity list; or, as another example, if the monitored service usage activity is not included in the enterprise service usage activity list, then it can be automatically classified as a consumer service usage activity by default).

[0043] In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes providing a service design center (SDC) for configuring an enterprise and consumer billing allocation of monitored service usage activities for a plurality of wireless communication devices associated with an enterprise account, and implementing the configured enterprise and consumer billing allocation for

monitored service usage activities for the plurality of wireless communication devices associated with the enterprise account.

[0044] In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes monitoring service usage of a wireless communication device, and determining whether a user is acting as a consumer (e.g., personal service usage activities on the wireless communication device) or a professional (e.g., enterprise service usage activities on the wireless communication device, that is, the user is working on the wireless communication device in his or her capacity as an employee for an enterprise, in which the wireless communication device is associated with an enterprise account for the enterprise) based on the monitored service usage activity (e.g., based on place, time of day, application or service activity, and/or other criteria or factors). In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities differentially charges and/or allocates billing between the enterprise and the consumer based on a classification of the monitored service usage activity as allocated to the enterprise or to the consumer for billing/charging purposes. Such embodiments enable a dual persona device user experience.

[0045] In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes monitoring a service usage activity of a wireless communication device, and reporting the monitored service usage activity to a network element (e.g., a service controller, a service usage reconciliation function, another service control or billing/charging function in the network, or another network element), in which the network element determines an enterprise and consumer billing allocation for the monitored service usage activity. In some embodiments, the network element (e.g., a service controller, a service usage reconciliation function, another service control or billing/charging function in the network, or another network element) determines an enterprise and consumer billing allocation for the monitored service usage activity. In some embodiments, a service usage reconciliation function determines how much service usage is due to enterprise service usage activities and how much is due to consumer service usage activities. In some embodiments, after determining the allocation between consumer and enterprise service usage activities, the service usage reconciliation function provides the information to a service usage accounting function (e.g., a carrier billing

server or an enterprise service usage accounting server), which in turn delivers a consumer usage report or bill and/or an enterprise usage report or bill. In some embodiments, the service usage reconciliation function determines the amount of enterprise service usage and creates a service usage credit record so that a device user's account can be credited or a device user can be compensated or reimbursed for enterprise service usage costs. In some embodiments, a service usage monitor is configured to monitor service usage activities of a device. In some embodiments, the service usage monitor is configured to classify the monitored service usage activities as enterprise service usage activities. In some embodiments, the service usage monitor is configured to classify the monitored service usage activities as consumer service usage activities. In some embodiments, the service usage monitor is configured to monitor a first group of service usage activities for service usage allocation to a device user (e.g., using a list of service usage activities associated with a consumer service usage), and a second group of service usage activities for service usage allocation to an enterprise (e.g., using a list of service usage activities associated with an enterprise service usage). In some embodiments, service usage activities (e.g., service activities, such as applications, network, and/or voice based activities that use wireless network service usage resources) are classified using various techniques described herein, such as based on application (e.g., application credential), device (e.g., device credential), time of day, network destination, network traffic protocol and/or port, and various other criteria/factors. In some embodiments, the service usage monitor is implemented in the network (e.g., on one or more network elements in the carrier network and/or enterprise network, as described herein). In some embodiments, the service usage monitor is implemented in the device (e.g., using various techniques described herein, including verifiable and/or secured device-based implementations). In some embodiments, the service usage monitor is implemented using both network-based and device-based techniques, as described herein with respect to various embodiments.

[0046] In some embodiments, a set of service activities that will be sponsored by an enterprise (e.g., a specified or configured list of enterprise sponsored service activities) is managed by an enterprise service design center. In some embodiments, a list of service activities and the associated service policies for each service activity are compiled to form an enterprise sponsored service activity policy set. For example, enterprise email, enterprise calendar, and enterprise contacts can be configured as sponsored service activities. In some embodiments, the sponsored

enterprise services list includes a list of network destinations that are associated with the services (e.g., an enterprise mail server address and/or an enterprise internal corporate network). For example, the enterprise email can be a sponsored service that is associated with an enterprise sponsored email service policy, which can limit destinations for corporate email, sizes of emails and/or email attachments, and/or other email related usage criteria or factors (e.g., a service usage charging policy).

[0047] In some embodiments, the monitored service usage is reported to the reconciliation function by a carrier network service usage monitoring element (e.g., a home agent (HA), access network gateway, or other network element, such as a deep packet inspection (DPI) function). In some embodiments, the monitored service usage is reported to the reconciliation function by an enterprise network service usage monitoring element (e.g., a carrier network gateway or a mobile services gateway/server or other element in the enterprise network that can measure service usage and associate it with a given device credential or application credential). In some embodiments, the monitored service usage is reported to the reconciliation function by an element in the mobile device (e.g., a service usage monitor in a secure enterprise mobile services application or a Service Processor function, which can be securely implemented and/or verified using various techniques described herein).

[0048] In some embodiments, a service design center for implementing enterprise and consumer billing allocation for wireless communication device service usage activities is provided. For example, an enterprise manager can use the service design center to select one or more services that the enterprise agrees to pay for/is responsible for paying for and to select one or more other services that the employees of the enterprise must agree to pay for/are responsible for paying for (e.g., if the employee elects to use/have such services that are not charged to the enterprise, or included as enterprise services that are charged to or paid for by the enterprise).

[0049] In some embodiments, a service design center that facilitates configuration of sponsored enterprise services for implementing enterprise and consumer billing allocation for wireless communication device service usage activities is provided. In some embodiments, a service design center for implementing enterprise and consumer billing allocation for wireless communication device service usage activities includes providing a service design center for a

carrier network and another service design center for an enterprise network (e.g., in some cases, these service design centers can be combined).

[0050] In some embodiments, an enterprise sponsored service activity policy set is created by an enterprise network administrator through an enterprise service design center user interface (UI). In some embodiments, the enterprise sponsored service activity policy set includes a list of network destination addresses that corresponds to the desired sponsored service activity list, along with an access policy or service usage charging policy for the service activities. In some embodiments, all service activities in the enterprise sponsored service activity policy set receive the same access policies or charging policies. In some embodiments, a first subset of one or more of the service activities in the enterprise sponsored service activity policy set receive access policies or charging policies that are different than that of a second subset of service activities. For example, a sponsored enterprise email service can be in the first subset, and sponsored mobile voice services can be in the second subset, as certain employees (e.g., traveling sales personnel and/or executives) can be granted international and/or roaming mobile voice services, and other employees can be granted more limited sponsored mobile voice services.

[0051] In some embodiments, the enterprise network administrator uses the enterprise service design center to create an enterprise sponsored service device group list that includes device credentials or device application credentials that the carrier network and/or the enterprise network can use to identify a device or an application on a device as belonging to the group of devices for which the enterprise desires to sponsor enterprise service activities. In some embodiments, a sponsored service activity policy set is created by an enterprise network administrator through an enterprise service design center UI, and an enterprise sponsored service device group list is created by an enterprise network administrator through an enterprise service design center UI, and the two lists are stored in the enterprise service design center in which they are associated with one another for the purpose of provisioning the carrier network, the enterprise network, and/or the devices to provide the desired enterprise sponsored services policy set to the enterprise sponsored services device group, as described herein with respect to various embodiments.

[0052] In some embodiments, the association between an enterprise sponsored services device group and an enterprise sponsored service policy set is used by a service design center to create a provisioning table, in which the provisioning table is a list of the provisioning programming required for the various carrier network elements, enterprise network elements, and/or device elements to implement the desired sponsored service activity policy set for the enterprise sponsored services device group.

[0053] For example, an enterprise can use the service design center to configure certain destinations/services as enterprise services or potentially enterprise services based on various factors (e.g., corporate sites, corporate email/email servers, corporate web pages/intranet, and can, for example, agree to pay for a certain level of general web browsing by usage/time of day and/or other factors, corporate contacts/calendars, corporate videoconferencing; and certain applications, such as web conferencing applications or other applications; certain telephone service usages, etc.). As another example, the service design center can present a configuration interface that allows users to select from one or more service plans that include various consumer and enterprise allocations and/or to select an enterprise only service plan.

[0054] In some embodiments, the service design center specifies one or more service plans the device user can select from and these service plan selection options are configured into a configuration interface on a device software application that allows users to select from one or more service plans that includes various consumer and enterprise allocations and/or to select an enterprise only service plan. In some embodiments, the configuration interface is made available directly on the device via a device client that provides a service plan selection user interface that displays one or more service plan options configured in the service design center or the enterprise service design center. In some embodiments, the configuration interface is presented directly on a device user interface (UI) when the user attempts to use an access service usage activity that requires a service plan to be activated or purchased. In some embodiments, the configuration interface presented via the device UI accepts a user response, transmits it to a carrier network element responsible for provisioning a new user service plan that in turn activates the service plan chosen by the user, possibly after confirming service payment credit for the user or enterprise entity. In some embodiments, the carrier network element responsible for provisioning a new user service plan is a carrier usage accounting server. In some

embodiments, the carrier network element responsible for provisioning a new user service plan is a consumer internet services element. In some embodiments, the carrier network element responsible for provisioning a new user service plan is a carrier gateway or home agent. In some embodiments the carrier network element responsible for provisioning a new user service plan is a billing system or service plan provisioning system. In some embodiments, the configuration interface is made available to the user in the form of a web site that provides a service plan selection user interface that displays one or more service plan options configured in the service design center or the enterprise service design center.

[0055] In some embodiments, the initial configuration of the end-user device includes one or more enterprise access service plans that allow the user to access certain applications or network destinations associated with enterprise access services, and the user can choose from one or more additional consumer oriented service plans offered directly on the device UI by a device software application in communication with a carrier network element responsible for provisioning a new user service plan that in turn activates the service plan chosen by the user, possibly after confirming service payment credit for the user or enterprise entity. In some embodiments, these access service plan options are configured with a service design center. In some embodiments, these access service plan options are configured with an enterprise service design center.

[0056] In some embodiments, enterprise data locally stored on the wireless communication device is secured and access to an enterprise network from the wireless communication device is secured so that only authorized devices or applications can access the network. In some embodiments, security for enterprise data and network access is accomplished by connecting the wireless communication device to the enterprise network via a secure mobile services application on the wireless communication device that connects via a secure channel to a secure mobile services gateway server in the enterprise network. In some embodiments, the SDC is programmed to provision the network and/or device apparatus to detect service usage communication with the mobile services gateway server and record that as a usage charge for network services. In some embodiments, such service usage communication with the mobile services gateway server is credited to the user's carrier account or used as a reimbursement to the user bill.

[0057] In some embodiments, determining the enterprise and consumer billing allocation for wireless communication device service usage activities is performed using a classifier implemented on the wireless communication device that classifies the monitored service usage activity (e.g., service usage can also be measured by the classifier and/or another function implemented on the wireless communication device, which can similarly be implemented in a secure execution area or in a secure memory), in which the classifier is executed in a secure execution area or a secure memory of the wireless communication device. In some embodiments, the security of the classifier is verified, periodically or at other times, using various techniques, such as by comparing a local service usage measure with a network based service usage measure and/or comparing a secured local service usage measure with another local service usage measure. In some embodiments, a secured application protects one or more enterprise applications (e.g., email, calendar, contacts, intranet access, and/or other enterprise specified applications, such as applications configured as approved or authorized enterprise applications for a particular enterprise by an enterprise manager using a service design center) from unauthorized use or tampering.

[0058] In some embodiments, the secure mobile services application also provides for usage monitoring of the enterprise service usage of the device. In some embodiments, the secure mobile services application also provides for service access control for the enterprise services of the device so that enterprise network access policies can be locally enforced on the device.

[0059] In some embodiments, security for enterprise data and network access is provided by connecting to the enterprise network via a secure mobile services application executed securely (e.g., in a virtual machine or in a hardware secured execution partition) on the wireless communications device that connects via a secure channel to a secure mobile services gateway server in the enterprise network. In some embodiments, security for enterprise data and network access is provided by connecting to the enterprise network via a secure mobile services application executed on a wireless communications device that includes a service processor, as described herein, that connects via a secure channel to a secure mobile services gateway server in the enterprise network. In some embodiments, the SDC is programmed to provision the network and/or wireless communications device apparatus to detect service usage communication with the mobile services gateway server, and record that as a usage charge for network services. In

some embodiments, such service usage communication with the mobile services gateway server is credited to the user's carrier account or used as a reimbursement to the user bill.

[0060] In some embodiments, the service processor also provides for service usage monitoring of the enterprise service usage of the device, as described herein with respect to various embodiments. In some embodiments, the service processor also provides for service access control for the enterprise services of the device so that enterprise network access policies can be enforced on the device, as described herein with respect to various embodiments.

[0061] In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes associating the wireless communication device and/or an authorized user of the wireless communication device (e.g., using device/user credentials) with an enterprise account (and, in some embodiments, a consumer account), associating an application with a service, and associating the service with the enterprise account (e.g., a service for the wireless communication device that the enterprise agreed to pay for). In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities further includes using application-based monitoring and/or control using, for example, device assisted services.

[0062] In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes crediting an associated consumer account for service usage allocated to an enterprise account. In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes billing the enterprise for service usage allocated to the enterprise account. In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes reporting to the enterprise (and, in some embodiments, the consumer) service usage allocated to the enterprise account, and the enterprise can, for example, provide an expense reimbursement to the consumer (e.g., employee, partner, associate, or contractor of the enterprise).

[0063] In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes associating the wireless communication device with an enterprise account and a consumer account, associating an application with a

service, and associating the service with the consumer account (e.g., a service for the wireless communication device that the consumer, such as an employee of the enterprise, agreed to personally pay for). In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities further includes using application-based monitoring and/or control using, for example, device assisted services.

[0064] In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes crediting an associated enterprise account for service usage allocated to a consumer account. In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes billing the consumer for service usage allocated to the consumer account. In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes reporting to the enterprise (and, in some embodiments, the consumer) service usage allocated to the consumer account, and the enterprise can, for example, deduct the cost for such service usage as an expense from the consumer's periodic/next paycheck.

In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities does not require a network element or a device element to control services. For example, a user with a device associated with a bulk service usage plan can be automatically credited for sponsored enterprise service usage. If the bulk service usage plan has a service plan cap associated with the user's consumer service plan, then the service usage classified as sponsored enterprise service usage can be deducted from the total service usage such that the sponsored enterprise service usage does not count towards the user's capped consumer service plan usage. As another example, an enterprise account associated with the wireless communication device and/or user can allow the user to exceed a monthly or other service plan cap for sponsored enterprise service usage (e.g., based on various criteria and/or other factors, such as a more restrictive enterprise service policy to avoid potential misuse of sponsored enterprise services for personal use).

[0065] In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities is provided using network-based and/or device-based techniques as described herein with respect to various embodiments. For example, using

various techniques described herein, an enterprise manager can control the services for wireless communication devices for the enterprise, including access to such services and/or charging for such services (e.g., services used by employees in which some are charged to the enterprise on behalf of the employee and some are charged to the employee as a consumer of such services) and user notification messages. For example, the enterprise manager or another network element/function can cap and/or control service usage for consumer services and/or enterprise services.

[0066] In some embodiments, a service usage reconciliation function is provided. In some embodiments, the service usage reconciliation function implements the rules for a billing split for the enterprise and consumer billing allocation for wireless communication device service usage activities, as described herein with respect to various embodiments. In some embodiments, the service usage reconciliation function also facilitates fraud detection, as described herein with respect to various embodiments.

Carrier Managed Billing Allocation With Service Usage Monitoring In Carrier Network

[0067] **Figure 1** illustrates a functional diagram of a network architecture 100 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. In some embodiments, a wireless communication device 110 includes a memory, an application processor (e.g., or more than one application processor or general processor), and a wireless modem, shown as an access modem 151. As shown, the wireless communication device 110 includes an operating system application space 131 for executing applications and communicating wirelessly using operating system lower layers 130, network stack 136, and the access modem 151. As used herein, application space refers to a portion of memory and a portion of a processor operating system execution environment for executing application programs. As also shown, the wireless communications device 110 includes operating system lower layers 130. As used herein, operating system lower layers refers to one or more OS layers that typically implement networking functions (e.g., network stack 136). In some embodiments, operating system lower layers 130 is where certain application data and communications security functions are implemented as described herein. In some embodiments, operating system lower layers 130 is

where certain service usage monitoring and reporting functions are implemented as described herein. In some embodiments, operating system application space 131 executes various user applications, including one or more of user data application 111 and user voice application 112, and various enterprise applications, including enterprise data application 124 and enterprise voice application 126. In some embodiments, the execution environment for user applications and enterprise applications is the same (e.g., as shown in Figures 1 through 7). For example, a consumer Internet browser can execute in the operating system application space 131 for providing Internet web site browsing or web based email service via network stack 136 and wireless access modem 151 (e.g., a wireless modem), and an enterprise email program can also execute in the operating system application space 131 to communicate with an enterprise email server also via network stack 136 and wireless access modem 151. In some embodiments, the execution environment for user applications and enterprise applications are not the same (e.g., as shown in Figures 8 through 12).

[0068] In some embodiments, device 110 accesses various network-based voice services, such as consumer voice services 167 and/or enterprise sponsored/paid-for consumer voice services usage, via voice network 165. As shown, voice network 165 is in communication with carrier access network 150 via carrier gateway/home agent (HA) 152. In some embodiments, device 110 accesses various Internet based services, such as consumer Internet services 162 and/or enterprise sponsored/paid-for consumer Internet services usage, via Internet 160.

[0069] As also shown in Figure 1, device 110 is in wireless communication (e.g., 2G/3G/4G access) with carrier access network 150. The carrier provides a carrier usage accounting server 154 (e.g., a carrier billing server) in communication with carrier access network 150. Carrier network access 150 is shown in communication with both Internet 160 and enterprise network 170 via Internet 160. Enterprise network 170 is shown in communication with Internet 160 as via enterprise firewall and secure access gateway 171 for protecting enterprise network 170 from unauthorized access. In some embodiments, to access enterprise network 170 through enterprise firewall and secure access gateway 171, device 110 includes a secure data application or a virtual private network application/function to facilitate secure authorization with enterprise firewall and secure access gateway 171 and to also protect the communication (e.g., encrypt such data communications). As also shown, behind enterprise firewall and secure access gateway 171,

enterprise network 170 provides communication with secure enterprise mobile services gateway/server 172 in communication with enterprise network 170. As shown, secure enterprise mobile services gateway server 172 includes various enterprise applications/functions, including as shown, mobile email 173, mobile synchronization 174, mobile contacts 175, mobile calendar 176, mobile communications 177, and mobile intranet 178. In some embodiments, secure enterprise mobile services gateway server 172 provides mobile device mobile access to various enterprise network intranet services via enterprise intranet servers 180. In some embodiments, the enterprise mobile services include email, contacts, calendar, enterprise communications, mobile device synchronization services, intranet internal web sites, internal enterprise applications, enterprise file systems, and/or other enterprise networking services. In some embodiments, secure enterprise mobile services gateway server 172 provides optimized mobile application formatting of the enterprise information or synchronization services to synchronize the enterprise database for the above services in an efficient and/or timely manner.

[0070] In some embodiments, carrier usage accounting server 154 (e.g., the carrier billing server) communicates (e.g., using secure communication techniques) with service usage reconciliation server function 158 to obtain reconciled service charging reports (e.g., reconciled billing reports) and/or enterprise service usage charging credit reports. In some embodiments, the reconciled service charging reports (e.g., reconciled billing reports) and/or enterprise service usage charging credit reports are processed by carrier usage accounting server 154 and reported as user usage record(s) 155 and/or enterprise usage record(s) 156. For example, mediating such charging and credit reports can be based on various factors as described herein (e.g., by application, time of day/day of week, and/or other factors). For example, the service usage charges that occur due to communication with the servers or services that are part of enterprise network 170, including secure enterprise mobile services gateway server 172 and intranet servers 180, can be counted as an enterprise service usage credit.

[0071] In some embodiments, enterprise service design center 194 issues device provisioning instructions for the device credential list from the enterprise services device group, and for each of the credentials, a service control policy is set on enterprise firewall/secure gateway 171 to allow properly authorized devices to reach the desired destinations listed on the enterprise service activity policy set. The provisioning of enterprise firewall/secure gateway 171 with the

enterprise service device group credentials and the enterprise service policy set is illustrated in Figure 1 by the "C" input designator.

[0072] In some embodiments, enterprise service design center UI 196 and enterprise service design center 194 are provided as shown in Figure 1. In some embodiments, enterprise service design center UI 196 and enterprise service design center 194 provide dedicated enterprise control of the network policy provisioning for configuring the service charging, accounting or billing allocation policies for differentiating between enterprise device service usage activities and consumer device service usage activities. Furthermore, in some embodiments, the portion of the enterprise network policy provisioning information that is needed to provision the carrier network elements to implement various techniques for allocating device service usage between enterprise and consumer activities is communicated between enterprise service design center 194 and carrier service design center 190.

[0073] A carrier provisioning system is typically not capable of providing direct access to an enterprise network administrator (e.g., carrier or enterprise personnel) for the purpose of provisioning such service charging capabilities. For example, such direct access is often not provided due to concerns related to the risk to the entire network that exists if network provisioning controls are made available to many different administrators to program charging allocation policies for many enterprises. However, as described herein, by isolating the required carrier network provisioning information to a secure service design center UI and policy configuration that only influences a small portion of the carrier network policy provisioning available to the carrier service design center and UI, the risk of causing such problems with the carrier network configuration is significantly reduced. Additionally, the process of performing the carrier side of the necessary provisioning is simplified for an administrator or in some cases can be automated.

[0074] The service design centers (e.g., carrier service design center 190 and enterprise service design center 194) are shown in Figure 1 and various other figures as separate network elements in order to more clearly define and discuss the functions of the service design centers. In some embodiments, enterprise service design center 194 is implemented in various other network elements (e.g., in enterprise network management apparatus, such as management

functions of secure enterprise mobile services gateway server 172 or other enterprise network management apparatus). In some embodiments, enterprise service design center 194 is implemented as a securely partitioned and managed device group interface to a subset of the provisioning capabilities of carrier network service design center 190. In some embodiments, enterprise service design center 194 is implemented as a securely partitioned and managed device group interface to a subset of the provisioning capabilities of a cloud-based secure enterprise mobile services network that is run by a centralized enterprise services provider such as an ASP or MVNO. As would be appreciated by one of ordinary skill in the art in view of the various embodiments described herein, enterprise service design center 194 can be implemented using various network and software/hardware architectures while providing for secure and controlled access as described herein.

[0075] In some embodiments, the enterprise service design center administrator creates or imports the enterprise service device group credentials and the enterprise service policy set using enterprise service design center UI 196. In some embodiments, the information included in the enterprise service device group credentials and the enterprise service policy set is also communicated from enterprise service design center 194 to carrier service design center 190 via the "C" connection designator as shown. For each of the device credentials listed in the enterprise services device group, carrier service design center 190 determines the information it needs to properly provision carrier gateway/home agent 152 with the proper access policy allowances and service usage charging policies to provide enterprise service access and usage credit for communications from device 110 to the enterprise network destination addresses specified in the enterprise service policy set. Programming of this provisioning information to carrier gateway/home agent 152 is indicated by the "A" information connector from carrier service design center 190 to carrier gateway/home agent 152. In some embodiments, this provisioning (e.g., programming) information sent via provisioning communication link "A" to carrier gateway/home agent 152 includes information to facilitate programming the enterprise device group credentials to: (i) receive the desired access service policy permissions, and (ii) implement the desired service usage accounting/charging policy settings. From the enterprise device group credentials list and the enterprise service activity policy set information provided in "C," carrier service design center 190 determines the information needed to properly provision the service usage reconciliation server function 158. Programming of this provisioning

information to service usage reconciliation server function 158 is indicated by the "B" information connector from carrier service design center 190 to service usage reconciliation server function 158. In some embodiments, service usage reconciliation function 158 is part of the carrier network, and service usage reconciliation function 158 implements the charging reconciliation rules to determine how much of the recorded device 110 service usage to place on the user's usage record or service bill (e.g., consumer service usage cost allocation) and how much to place on the enterprise's usage record or service bill (e.g., enterprise service usage cost allocation).

[0076] An enterprise may wish to allow consumer services on an end-user device that also allows an employee to access enterprise services over the access network. In some such embodiments, service design center 190 specifies one or more service plans from which the device user can select, and these service plan selection options are configured into a configuration interface on a device software application (e.g., user data app 111, user voice app 112 or service processor framework program 139 (shown, e.g., in Figure 16)) that allows users to select from one or more service plans, for example, one or more plans with both consumer and enterprise allocations, and/or an enterprise-only service plan. In some embodiments, the configuration interface is made available directly on the device via a device client that provides a service plan selection user interface that displays one or more service plan options configured in service design center 190 or enterprise service design center 194. In some embodiments, the configuration interface is presented directly on the device user interface (UI) when the user attempts an access service usage activity that requires a service plan to be activated or purchased. In some embodiments, the configuration interface presented to the device UI accepts a user response and assists in sending the user response to a carrier network element responsible for provisioning a new user service plan that in turn activates the service plan chosen by the user, possibly after confirming service payment credit for the user or enterprise entity. In some embodiments, the carrier network element responsible for provisioning a new user service plan is carrier usage accounting server 154. In some embodiments, the carrier network element responsible for provisioning a new user service plan is consumer Internet services elements 162. In some embodiments, the carrier network element responsible for provisioning a new user service plan is a carrier gateway/home agent 152. In some embodiments, the carrier network element responsible for provisioning a new user service plan is a billing system or service plan

provisioning system. In some embodiments, the configuration interface is made available to the user in the form of a web site that provides a service plan selection user interface that displays one or more service plan options configured in service design center 190 or enterprise service design center 194.

[0077] In some embodiments, the initial configuration of device 110 includes one or more enterprise access service plans that allow the user to access certain applications or network destinations associated with enterprise access services, and the user can choose from one or more additional consumer-oriented service plans offered directly on the device UI by a device software application (e.g., user data app 111, user voice app112, or service processor framework program 139) in communication with a carrier network element responsible for provisioning a new user service plan that in turn activates the service plan chosen by the user, possibly after confirming service payment credit for the user or enterprise entity. In some embodiments, these access service plan options are configured using service design center 190. In some embodiments, these access service plan options are configured using enterprise service design center 194.

[0078] In some embodiments in which a user has selected a consumer-oriented service plan in addition to an enterprise service plan, service usage reconciliation function 158 distinguishes between data usage within the enterprise service plan and data usage within the consumer-oriented service plan. In some embodiments, the enterprise does not pay for, backhaul, process, or police data usage associated with the consumer-oriented plan. In some embodiments, service usage reconciliation function 158 determines how much data usage by device 110 is enterprise data usage, and how much data usage by device 110 is consumer data usage. In some embodiments, service usage reconciliation function 158 allocates data usage associated with applications and/or services specified by the enterprise service plan to the enterprise, and data usage associated with applications and/or services specified by the consumer-oriented data plan to the consumer.

[0079] The various embodiments described herein with respect to Figure 1 support a variety of techniques for allocating service usage accounting or billing between enterprise services and consumer services. For example, service usage reconciliation function 158 can report measured

total usage, measured consumer usage, and/or measured enterprise usage to carrier usage accounting server 154. In some embodiments, the reconciliation service usage function (e.g., provided by service usage reconciliation function 158 and/or another element/function) implements the business rules that determine how much of the service usage to charge the user (e.g., a consumer service usage allocation) and how much of the service usage to charge the enterprise (e.g., an enterprise service usage allocation). In some embodiments, the service usage reconciliation service usage function records total device service usage, records total enterprise service activity service usage, and then subtracts the enterprise service usage from the total device service usage to determine a consumer service usage (e.g., a consumer service usage allocation). In some embodiments, service usage reconciliation function 158 passes on the enterprise service usage as a credit to the consumer account. In some embodiments, this credit is accounted for by the carrier billing the user at a reduced amount according to the credit and billing the enterprise for an increased amount according to the credit. In some embodiments, the credit is accounted for by communicating the credit to the enterprise so the enterprise can reimburse the consumer (e.g., generating an expense reimbursement for the credit to the consumer as an employee or contractor of the enterprise, directly paying the enterprise allocation of the carrier bill for the consumer, and/or various other approaches as described herein). In some embodiments, the credit is reported to the enterprise so that the enterprise can seek payment for the non-enterprise service usage (e.g., consumer service usage allocation) from the consumer (e.g., who can be an employee or contractor of the enterprise).

[0080] As another example, an enterprise allocation can also include providing an allowance for a certain level of monthly usage of data and/or voice. In some embodiments, carrier usage accounting server 154 generates a bill for the associated consumer account (e.g., associated with device 110, such as based on the device/user credentials) that reflects the cost of the service usage allocated to consumer service usage and a credit for the cost of service usage allocated to enterprise service usage (e.g., to offset the cost of the enterprise service usage, which can be billed to the enterprise account associated with the enterprise service usage for the device 110). As described herein, based on an allocation of enterprise and consumer service usage, various techniques for billing/charging and generating credits/reporting (e.g., the enterprise can generate the user/employee monthly expense reimbursements to compensate the user/employee for the determined cost of the enterprise service usage and/or other approaches as described herein) can

be provided using the network architecture 100 and/or other network architectures, as described herein.

[0081] In some embodiments, an enterprise manager manages service usage by specifying an access network service usage limit for a service usage activity (such as data service, voice service, text service, a roaming service, or a more detailed classification of data service such as one or more websites or one or more device applications), and, when that usage limit is reached for a device that is managed by the enterprise manager, a service usage notification message is generated. In some embodiments, the service usage notification message is configured through enterprise service design center UI 196. In some embodiments, the service usage notification message is delivered to device 110. In some embodiments, the service usage notification message is presented to the user via a user interface of device 110.

[0082] In some embodiments, the service usage notification message provides information about data usage or the status of device 100. In some embodiments, the service usage notification message is triggered by an event, e.g., detection that device 110 reaches a data usage ceiling, determination that device 110 is roaming, etc. In some embodiments, the service usage notification message provides real-time or near-real-time information about data usage. In some embodiments, the service usage notification message provides information about remaining data usage availability or entitlement. In some embodiments, the service usage notification message comprises a detailed report of enterprise usage by user, user group, device, device group, or location.

[0083] In some embodiments, secure enterprise mobile services gateway server 172 is a dedicated enterprise application server for a particular enterprise (e.g., company, government organization, school/university, or another entity). In some embodiments, secure enterprise mobile services gateway server 172 is a carrier or a third party service provider (e.g., a carrier for wireless network services, such as AT&T, Sprint, T-Mobile, and/or various other wireless network service providers/carriers or third party service providers) controlled/managed application server that performs the application server functions for various different enterprises (e.g., as a service/outsourced IT services model). In some embodiments, device 110 is partitioned (e.g., associated with a particular enterprise/MVNO partition and associated

enterprise account) based on device credentials and/or VPN to determine a service plan for managing (e.g., to determine how to allocate enterprise/consumer service usage for) device 110. In some embodiments, based on the partition determination of device 110, and the associated service plan for managing device 110, appropriate service usage monitoring and classification can be determined for providing an enterprise and consumer allocation for service usage activities of device 110 based on the associated service plan(s).

[0084] For example, by programming the business rules in service usage reconciliation function 158 that determine the service usage accounting allocation between enterprise services and consumer services, many approaches can be provided for creating a service that provides an enterprise service to a device when the device user has selected a consumer service plan or elected to pay for a consumer service plan. As an example, if the device user has chosen a service plan, the enterprise service usage accounted for in enterprise usage record 156 can be billed to the enterprise rather than the consumer. As another example, if the device user has chosen a service plan, the consumer service usage accounted for in user usage record 155 can be billed to the device user rather than the enterprise. As yet another example, if the device user has selected a service plan, the enterprise service usage can be communicated to the enterprise (e.g., and/or the device user), and the enterprise can issue a reimbursement to the device user for the enterprise portion of the user's bill, or pay the carrier directly for a portion of the user's bill, thus reducing the amount the user must pay. In some embodiments, the business rules in service usage reconciliation function 158 are programmed to provide the device user with a certain amount of service usage that may or may not be directly related to enterprise services.

[0085] For example, the user can be allocated a certain amount of general purpose browsing that includes network destinations that are not specified in the enterprise service activity policy set. In some embodiments, there is a cap to such general purpose browsing, and carrier service design center 190 can provision the network and/or the device to alert the user regarding how much of the enterprise sponsored browsing remains or when the enterprise sponsored internet browsing cap is reached or exceeded. In some embodiments, the business rules in service usage reconciliation function 158 are programmed to deduct the service usage associated with the enterprise sponsored general purpose browsing, up to the specified cap, from the user's bill. In this way, the user can be allocated an allowance for services that either the enterprise sponsors to

account for enterprise related service usage that may not be included in the enterprise service activity policy set or that the enterprise simply desires to sponsor to reduce the device user's consumer service plan billing.

[0086] In a similar manner, services other than browsing that are not necessarily associated with enterprise service usage can also be sponsored by the enterprise by properly provisioning the business rules in service usage reconciliation function 158. For example, a catch-all enterprise sponsored allowance (e.g., or cap) for "bulk" internet usage can be provided. The fact that the user is provided with such an allowance may be pointed out to the user if the user disputes how much of his or her device service usage cost should be covered by the enterprise and how much the user should cover personally. Another example is to provide a certain amount of voice minutes to any phone number or to phone numbers not in the enterprise service activity policy set.

[0087] In some embodiments, the business rules in service usage reconciliation function 158 are provisioned so that the enterprise specifically does not allow, sponsor, or pay for certain device service usage activities. In some embodiments, these service usage activities can include access to network destinations, applications, or services that pose security risks to enterprise data stored on device 110 or pose security risks to enterprise network 170. In some embodiments, these activities include access to network destinations, applications, or services that the enterprise does not wish to sponsor or that are potentially associated with user activity that violates enterprise policy or laws. For example, the business rules may be configured to allow only transmission of business data on approved networks, e.g., excluding free or unknown WiFi hotspots, or only when device 110 is connected to the network via a VPN. In some embodiments, such service usage activities that violate enterprise security policies or other service usage policies are blocked by the business rules programmed into the network or the device as specified in the enterprise service activity policy set.

[0088] By programming the business rules in service usage reconciliation function 158 that determine the service usage accounting allocation between enterprise services and consumer services, many approaches can be provided for creating a service that provides an enterprise service to a device when the device user has not selected a consumer service plan or elected to

pay for a consumer service plan. For example, if the device user has not chosen to select or pay for a consumer service plan, carrier gateway/home agent 152 can be programmed to allow service usage for the enterprise service policy set but deny all other access until the user chooses a consumer service plan. In some embodiments, when/if the consumer chooses a consumer service plan then access would be expanded beyond just the enterprise services, because when the service plan activation occurs, consumer service policy set in carrier gateway/home agent 152 will be updated to allow service (e.g., as the carrier administrator user of carrier service design center 190 programs a different set of consumer service access policies for each consumer service plan that can be chosen). In some embodiments, the user is allocated a certain amount of general purpose data access or voice minutes as described above even though the user does not have a consumer data plan. Another example is to provide the user with a certain monetary allowance that is sponsored by the enterprise rather than a service usage amount.

[0089] Although enterprise service design center 194 is shown provisioning mobile server usage counter 179 (e.g., shown in Figure 5) and enterprise firewall/secure gateway 171, it should be understood that not all device provisioning connections as shown from secure enterprise mobile services gateway/server 172 to device 110 are shown for device functions including secure mobile services application access, communication link provisioning (e.g., cryptographic encryption keys, VPN settings, and various other security/communication provisioning), security programs, service control programs, and program settings for enterprise service applications, such as email, calendar, contacts, mobile synchronization services, and traffic control. As shown, the labeled provisioning connections are provided as exemplary embodiments to assist in identifying the network elements that are provisioned for network access control and network service usage charging reporting. Those of ordinary skill in the art will appreciate that these additional device provisioning functions are not necessarily specifically called out with provisioning connection labels in each figure, and it will be apparent to one of ordinary skill in the art which of these device provisioning functions and connections are needed from enterprise service design center 194 and device 110. It will also be apparent to one of ordinary skill in the art in view of the various embodiments described herein that the various device provisioning connections and device element programming configurations needed to provision these device functions can be managed by secure enterprise mobile services gateway/server 172 via a device management communications link. It will also be apparent to one of ordinary skill in the art that,

in some embodiments, the flow of policy provisioning information for the various device elements that participate in establishing service usage monitoring and reporting policies or service access control policies starts in enterprise service design center 194 and flows through secure enterprise mobile services gateway/server 172 over a device management link, and through the device management link on device 110 to the device 110 functional elements that need to be provisioned. In various embodiments described herein, the device elements that are provisioned in some embodiments to set up enterprise services, service usage monitoring and reporting policies, or service usage access control policies include one or more of enterprise data application 124, enterprise voice application 126, secure mobile enterprise application environment 120 (shown, e.g., in Figure 8), secure network interface 128 (shown, e.g., in Figure 8), secure enterprise mobile services application 125 (shown, e.g., in Figure 13), virtual machine #2 secure enterprise application environment 118 (shown, e.g., in Figure 14), enterprise application secured hardware execution partition 106 (shown, e.g., in Figure 15), device service usage monitor 119 (shown, e.g., in Figure 17), service processor framework program 139 (shown, e.g., in Figure 16), and/or service processor kernel program 138 (shown, e.g., in Figure 16).

[0090] In some embodiments, service usage reconciliation function 158, or secure enterprise mobile services gateway/server 172, or another similar network function, is programmed to review traffic usage patterns of mobile device 110 for the purpose of determining if the device may have fallen into unauthorized hands or if the device secure enterprise communications and data management software may have been hacked or tampered with in a way that endangers enterprise security or causes the enterprise to be billed for usage that is not enterprise usage. For example, service usage reconciliation function 158 (e.g., or secure enterprise mobile services gateway/server 172) can be programmed to monitor "bulk" enterprise service usage for the enterprise device group and trigger a fraud detection alert for a device that exhibits enterprise usage that is higher than a pre-determined "normal" limit. As another example, service usage reconciliation function 158 can be programmed to monitor "bulk" enterprise service usage for the enterprise device group and trigger a fraud detection alert for a device that exhibits enterprise usage access patterns that are determined to be outside of "normal" limits. Examples of usage patterns can include usage as a function of time of day, duration of usage, usage above a certain

limit for a subset of service usage activities, and/or usage above a certain limit for all service usage activities.

[0091] In some embodiments, enterprise service design center 194 is configured to receive or accept a specification for an access network service usage limit (e.g., a service amount in minutes, bytes, or cost) for a service usage activity (such as a data service, a voice service, a text service, a roaming service, or a more detailed classification of a data service, such as one or more websites or one or more device applications), and the service usage limit is applied to one or more devices 110 or device groups (or users or user groups) managed by enterprise service design center 194. In some embodiments, enterprise service design center 194 is further configured to receive service usage records for device 110, which is managed by enterprise service design center 194, from a network element configured to monitor and report device 110 service usage (e.g., carrier usage accounting server 154, enterprise firewall/security gateway 171, or another network element), and when the usage limit is reached, to generate a service usage notification message. In some embodiments, enterprise service design center 194 is configured to deliver the service usage notification message to enterprise service design center UI 196. In some embodiments, enterprise service design center 194 is configured to deliver the service usage notification message to a software application of device 110 (e.g., service processor framework program 139 or user data app 111) for presentation to the device user through a user interface of device 110.

[0092] In some embodiments, enterprise service design center 194 is configured to receive or accept a specification for an access network service notification event consisting of a network access pattern achieved or attempted by device 110 that belongs to a device group (or user group) managed by enterprise service design center 194, wherein the network access pattern is access attempted or achieved by one or more pre-defined device applications, or access attempted or achieved by device 110 to one or more network destinations, websites or network servers. In some embodiments, enterprise service design center 194 is further configured to receive service usage records for device 110, which is managed by enterprise service design center 194, from a network element configured to monitor and report device 110 service usage (e.g., carrier usage accounting server 154, enterprise firewall/security gateway 171, or another network element), and when the service usage indicates that the network access pattern has

occurred, enterprise service design center 194 is further configured to send a notification message to enterprise service design center UI 196.

Carrier Managed Billing Allocation With Service Usage Monitoring In Carrier Network and Enterprise Firewall/Gateway

[0093] **Figure 2** illustrates a functional diagram of another network architecture 101 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 101 of Figure 2 is similar to network architecture 100 of Figure 1, except that in network architecture 101 of Figure 2, service usage reconciliation function158 receives service usage information from enterprise firewall/secure gateway 171 in addition to carrier gateway/home agent 152. This allows for various techniques that augment the capabilities of carrier gateway/home agent 152. For example, in networks in which it is impractical or infeasible for carrier gateway/home agent 152 to keep track of the service usage accounting allocation between the enterprise service policy set and consumer services for the devices in the device group, service usage reconciliation function 158 can receive total device service usage from carrier gateway/home agent 152, and receive the enterprise service usage from enterprise firewall/secure gateway 171. With this information, service usage reconciliation service usage function 158 can perform the allocation between enterprise service usage and consumer service usage without any detailed service usage reports from carrier gateway/home agent 152.

[0094] There are several reasons that the carrier network may not support numerous enterprise service customers with an enterprise/consumer allocation architecture that requires carrier gateway/home agent 152 to perform the necessary traffic classification or service usage classification as in the Figure 1 embodiment. For example, these reasons can include: (i) carrier gateway/home agent 152 does not have the detailed service usage classification capability (e.g., deep packet inspection function(s)) required to allocate service usage between the enterprise service policy set and consumer services for the devices in the device group, (ii) carrier gateway/home agent 152 is capable of performing the service monitoring required but can only do it for a limited number of devices (e.g., scaling issues), and/or (iii) there are too many device groups being managed by enterprise partners of the carrier creating a situation where the number

of specialized profiles that must be supported by carrier gateway/home agent 152 is larger than can be accommodated by the profile management capacity of the gateway system (e.g., scaling issues). As would now be apparent to those of ordinary skill in the art in view of the embodiments described herein, there are other reasons that can make it advantageous to provide the enterprise service usage from the enterprise network.

[0095] In some embodiments, provisioning with the service design centers and UIs for the embodiment shown in Figure 2 is similar to that of Figure 1. In some embodiments, the billing allocation capabilities of the two embodiments are similar if carrier gateway/home agent 152 is fully capable of differentiating service usage between the enterprise service policy set and the consumer services, but if not, then as discussed above, the billing allocation capabilities of the Figure 2 embodiment can be preferable in such environments.

[0096] Because the enterprise service usage is monitored by the enterprise network elements in the embodiments depicted in Figure 2, various service accounting or billing policies are available to the enterprise or carrier. For example, the amount of service usage resulting from enterprise services that occur during roaming conditions can be accounted for even when the carrier network does not receive detailed classification of service usage from roaming network partners. The business rules programmed into service usage reconciliation function 158 that are determined by the enterprise service activity policy set can break-out enterprise-service-related roaming charges separately from consumer-service-related roaming charges so that the enterprise-service-related roaming charges are sponsored or paid by the enterprise and consumer roaming service usage activities are not subsidized or are only partially subsidized. In addition, in some embodiments, secure enterprise mobile services gateway/server 172 includes the capability to determine if device 110 is roaming so that the access control policies specified in the enterprise service activity policy set can include modification or denial of access to enterprise network 170 services allowed by enterprise firewall/secure gateway 171 or secure enterprise mobile services gateway/server 172 during roaming conditions even though the access is not controlled by the carrier home network.

[0097] In some embodiments, an active network detection function is included on the device to assist the network policy enforcement elements to determine the type of network the device is

connected to or to determine if the device is on a home or roaming network, as described herein. For example, the service usage policy allowances provided by the enterprise service activity policy set can be programmed so that the allowances change depending on the availability of a particular network or set of networks, the time of day, the congestion state of a network, or the current cost of service on the network. For example, if the carrier home network is not available and only a roaming network is available, the allowance may be decreased or removed. As another example, if a certain network type is not available but another network type is (e.g., 2G is available instead of 3G or 3G is available instead of 4G), then the allocation can be reduced. As yet another example, if a variable charging policy is in place with the carrier for access when the network is busy or during certain times of day, then the enterprise sponsored allowance can be reduced during times of higher charging.

Enterprise Managed Billing Allocation With Service Usage Monitoring in Carrier Network And Enterprise Firewall/Gateway

[0098] **Figure 3** illustrates a functional diagram of another network architecture 102 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 102 of Figure 3 is similar to network architecture 101 of Figure 2, except that in network architecture 102 of Figure 3, service usage reconciliation function 158 receives overall device service usage information from carrier usage accounting server 154 and also receives enterprise device service usage information from enterprise firewall/secure gateway 171. In some embodiments, there is no interaction between the provisioning of the carrier network and the provisioning of the enterprise network, and it is assumed that service usage reconciliation function 158 and enterprise usage accounting server 159 are both under the control of the enterprise administrator. This approach allows for various techniques that provide for enterprise allocation of consumer service usage and enterprise service usage without the need to interface to the carrier network other than to get the overall usage summary. For example, service usage reconciliation function 158 can receive total or "bulk" usage from carrier usage accounting server 154, receive enterprise service usage from enterprise firewall/secure gateway 171, and determine the amount of consumer service usage, enterprise service usage, and/or an enterprise service usage credit.

[0099] In some embodiments, provisioning with the service design centers and UIs for the embodiment shown in Figure 3 is similar to that of Figure 1 except that no provisioning of enterprise service parameters is required in the carrier network. The billing allocation capabilities are also similar if carrier gateway/home agent 152 is fully capable of differentiating service usage between the enterprise service policy set and the consumer services, but if not, then as discussed above, the billing allocation capabilities of the Figure 3 embodiment can be preferable in such environments. For example, using network architecture 102, the enterprise can deal directly with its employees without the need to bring the carrier into the consumer-versus-enterprise allocation process. As an example, the enterprise could have a policy in which consumers purchase their own mobile device services and then get credit for enterprise mobile device services at the end of each billing period. This credit can be provided back to the employee in the form of an expense reimbursement or an increase in their next paycheck.

Enterprise Usage Credit With Service Usage Monitoring in Enterprise Firewall/Gateway

[00100] **Figure 4** illustrates a functional diagram of another network architecture 103 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 103 of Figure 4 is similar to network architecture 102 of Figure 3, except that in network architecture 103 of Figure 4, service usage reconciliation server function 158 receives no overall device service usage information from the carrier network. As shown in Figure 4, the source of service usage information is enterprise network 170 (e.g., via the enterprise firewall/secure gateway 171). In some embodiments, there is no interaction between the provisioning of the carrier network and the provisioning of the enterprise network, and it is assumed that service usage reconciliation function 158 and enterprise usage accounting server 159 could both be under the control of the enterprise administrator. For example, network architecture 103 of Figure 4 can be less dependent on the carrier than network architecture 102 of Figure 3 in that no billing information feed is provided. Using various techniques described herein, an enterprise service usage credit can be determined, and the determined enterprise service usage credit can be reimbursed to the device user.

Carrier Managed Billing Allocation With Service Usage Monitoring In Carrier Gateway/Home Agent And Enterprise Mobile Services Gateway Server

[00101] **Figure 5** illustrates a functional diagram of another network architecture 200 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 200 of Figure 5 is similar to network architecture 101 of Figure 2, except that in network architecture 200 of Figure 5, secure enterprise mobile services gateway/server 172 includes mobile server usage monitor 179, and the enterprise service usage reports from this function are sent to service usage reconciliation function 158 instead of usage reports being sent from enterprise firewall/secure gateway 171. In some embodiments, various specialized needs of monitoring, recording, and reporting enterprise service usage are confined to the special-purpose secure enterprise mobile services gateway/server 172 rather than requiring the often more general-purpose enterprise firewall/secure gateway 171 to perform these functions.

Enterprise Managed Billing Allocation With Service Usage Monitoring in Carrier Network And Enterprise Mobile Services Gateway Server

[00102] **Figure 6** illustrates a functional diagram of another network architecture 201 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 201 of Figure 6 is similar to network architecture 102 of Figure 3, except that in network architecture 201 of Figure 6, secure enterprise mobile services gateway/server 172 includes mobile server usage monitor 179, and the enterprise service usage reports from this function are sent to service usage reconciliation function 158 instead of usage reports being sent from enterprise firewall/secure gateway 171. For example, this approach allows for the specialized needs of monitoring, recording, and reporting enterprise service usage to be performed by the special-purpose secure enterprise mobile services gateway/server 172 rather than requiring the often more general-purpose enterprise firewall/secure gateway 171 to perform such functions.

Enterprise Usage Credit With Service Usage Monitoring in Enterprise Mobile Services Gateway Server

[00103] **Figure 7** illustrates a functional diagram of another network architecture 202 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 202 of Figure 7 is similar to network architecture 103 of Figure 4, except that in network architecture 202 of Figure 7, secure enterprise mobile services gateway/server 172 includes mobile server usage counter 179, and the enterprise service usage reports from this function are sent to service usage reconciliation function 158 instead of usage reports being sent from enterprise firewall/secure gateway 171. For example, this approach allows for the specialized needs of monitoring, recording and reporting enterprise service usage to be performed by the special-purpose secure enterprise mobile services gateway/server 172 rather than requiring the often more general-purpose enterprise firewall/secure gateway 171 to perform such functions.

Carrier Managed Billing Allocation With Device Mobile Enterprise Services Application Environment and Service Usage Monitoring In Carrier Network

[00104] **Figure 8** illustrates a functional diagram of another network architecture 300 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. As shown, secure mobile enterprise application environment 120 and secure network interface 128 within secure mobile enterprise application environment 120 are included in device 110. Also, server secure network interface 127 is included in secure enterprise mobile services gateway/server 172. In some embodiments, secure mobile enterprise application environment 120 protects sensitive enterprise information that is stored on device 110 (e.g., email text and downloads, calendar information, contacts, intranet data, or any other enterprise data) and provides a secure communication channel function to allow for authentication with server secure network interface 127 on secure enterprise mobile services gateway/server 172. As also shown, a user services application environment in device 110 includes various user applications, such as user data application 111 and user voice application 112.

[00105] In some embodiments, provisioning of the various network architecture elements to facilitate the allocation between enterprise service usage accounting or billing and consumer service usage accounting or billing is established as follows. The device portion of secure

network interface 128 and the enterprise server portion of server secure network interface 127 are provisioned with connection "E." In some embodiments, this provisioning operation with the connection labeled "E" includes programming information for secure network interface 128 to direct enterprise network 170 access traffic associated with application functions running in secure mobile enterprise application environment 120 to enterprise network 170 destinations that are to be sponsored (and, in some embodiments, possibly intermediate network routes) according to the enterprise services policy set, including, for example, the addresses (e.g., IP, IP/port or other higher layer address identifiers) of secure enterprise mobile services gateway/server 172 or enterprise intranet servers 180. In some embodiments, the provisioning operation designated with the connection label "E" also establishes the parameters required for the secure communication of information between secure network interface 128 and server secure network interface 127. In some embodiments, this provisioning step sets up the policies for the authentication process, data encryption, and cryptographic key exchange processes take place to establish secure communication between secure mobile enterprise application environment 120 and secure enterprise services gateway/server 172.

[00106] In some embodiments, the enterprise network destinations that are to be sponsored according to the enterprise services policy set identified by provisioning connection "E" are also communicated to carrier service design center 190. For example, this allows carrier service design center 190 to determine and transmit the proper provisioning information to establish the access control policies or service usage accounting policies for these aspects of the enterprise services policy set. Carrier service design center provisioning connections "A" communicate the provisioning information (programming) to carrier gateway/home agent 152. Carrier service design center provisioning connections "B" communicate the provisioning information (programming) to service usage reconciliation function 158.

[00107] In some embodiments, the provisioning operation associated with the provisioning connection label "C" provisions enterprise firewall/secure gateway 171 to admit devices 110 with device credentials or application credentials that belong to the desired enterprise services device group associated with the enterprise service policy set. In some embodiments, the provisioning information labeled as "C" includes enterprise network 170 destinations that are to be sponsored (and, in some embodiments, possibly intermediate network routes) according to the

enterprise services policy set. In some embodiments, the provisioning information labeled as "C" includes only the network destinations for secure enterprise mobile services gateway/server 172, and devices 110 are not allowed access to other parts of enterprise network 170.

[00108] In some embodiments, network architecture 300 for providing enterprise and consumer billing allocation for wireless communication device service usage activities includes executing an enterprise application as a secure enterprise data application 124 in secure mobile enterprise application environment 120 of device 110 in which the secure applications are in network communication (e.g., secure network communication, such as via a virtual private network (VPN) or other secure network communication techniques) with secure enterprise mobile services gateway/server 172 (e.g., executing an enterprise server side of the enterprise authorized/sponsored applications, such as an enterprise email server, an enterprise calendar server, an enterprise contacts server, and/or an enterprise network access server) of the enterprise. In some embodiments, the secure enterprise mobile services gateway/server 172 performs application monitoring that includes counting application service usage (e.g., bytes used in communicating with the device's execution of secure enterprise application 124). In some embodiments, secure enterprise mobile services gateway/server 172 performs application monitoring that further includes classifying application service usage (e.g., classifying secure enterprise application 124 by application/service usage activity such as based on application name or using signed code/hash techniques, by time of day/day of week, enterprise server, destinations, enterprise intranet, and/or other factors).

Carrier Managed Billing Allocation With Device Mobile Enterprise Services Application Environment and Mobile Services Gateway Server With Service Usage Monitoring In Carrier Network

[00109] **Figure 9** illustrates a functional diagram of another network architecture 301 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 301 of Figure 9 is similar to network architecture 300 of Figure 8, except that in network architecture 301 of Figure 9, secure enterprise mobile services gateway/server 172 is located between the Internet 160 and enterprise network 170. For example, this approach allows for server secure network interface

127 of secure enterprise mobile services gateway/server 172 to restrict access to enterprise network 170 and enterprise intranet servers 180 based on device authentication and/or various other security techniques (e.g., secure access, authentication, and/or communication techniques), as would be apparent to one of ordinary skill in the art in view of the various embodiments described herein.

Carrier Managed Billing Allocation With Device Mobile Enterprise Services Application Environment and Mobile Services Gateway Server With Service Usage Monitoring In Carrier Network And Mobile Services Gateway Server

[00110] **Figure 10** illustrates a functional diagram of another network architecture 302 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 302 of Figure 10 is similar to network architecture 301 of Figure 9, except that in network architecture 302 of Figure 10, secure enterprise mobile services gateway/server 172 includes mobile service usage monitor 179 that reports enterprise service usage to the service usage reconciliation function 158. In some embodiments, various specialized needs of monitoring, recording, and reporting enterprise service usage are confined to the special-purpose enterprise mobile services gateway/server 172 rather than requiring the often more general-purpose enterprise firewall/secure gateway 171 and/or other network elements/functions to perform such functions.

Enterprise Managed Billing Allocation With Device Mobile Enterprise Services Application Environment and Mobile Services Gateway Server With Service Usage Monitoring In Mobile Services Gateway Server

[00111] **Figure 11** illustrates a functional diagram of network architecture 303 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 303 of Figure 11 is similar to network architecture 302 of Figure 10, except that network architecture 303 of Figure 11 includes another carrier usage accounting server 154B that reports service usage to service usage reconciliation function 158. In some embodiments, carrier usage accounting server 154B receives overall or bulk service usage data from carrier gateway/home agent 152 and forwards such information to service usage reconciliation function 158. Service usage reconciliation

function 158 reconciles the overall or bulk service usage received from carrier accounting server 154B and the enterprise service usage received from mobile server usage monitor 179 and provides such reconciled service usage information to carrier usage accounting server 154A.

Enterprise Usage Credit With Device Mobile Enterprise Services Application Environment and Mobile Services Gateway Server With Service Usage Monitoring In Mobile Services Gateway Server

[00112] **Figure 12** illustrates a functional diagram of network architecture 304 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 304 of Figure 12 is similar to network architecture 303 of Figure 11, except that in network architecture 304 of Figure 12, the only service usage reported to service usage reconciliation function 158 is the enterprise service usage received from mobile server usage monitor 179. In some embodiments, service usage reconciliation function 158 reconciles the enterprise service usage received from mobile server usage monitor 179 and provides such reconciled service usage information to carrier usage accounting server 154, which generates enterprise service usage record(s) 156.

Device Configurations Without Service Usage Monitoring and Reporting

[00113] **Figure 13** illustrates a functional diagram of a secure device application architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. As shown, device 110 includes an operating system application space 131, operating system lower layers 130 including network stack 121, and access modem (e.g., wireless modem) 129. As also shown, operating system application space 131 includes various user applications, such as user data application 111 and user voice application 119, and service usage monitor 119. Operating system application space 131 also includes secure enterprise mobile services application 125, which includes various enterprise applications, such as email, synchronization, contacts, calendar communications, and intranet. Secure enterprise mobile services application 125 also includes secure network interface 128 (e.g., for securely communicating with an enterprise network).

[00114] **Figure 14** illustrates a functional diagram of another secure device virtual machine architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Figure 14 is similar to Figure 13, except that in Figure 14 the user applications are executed/stored within virtual machine (VM) #1 consumer application environment117, and secure enterprise mobile services application 125 is included within virtual machine (VM) #2 secure enterprise application environment 118. Device 110 also includes virtual machine operating system 115 that includes virtual OS instantiation #1 117A for VM #1 consumer application environment 117 and virtual OS instantiation #2 118A for VM #2 secure enterprise application environment 118. As also shown, virtual machine operating system 115 includes virtual machine OS network stack 116.

[00115] **Figure 15** illustrates a functional diagram of another secure device hardware execution partition architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Figure 15 is similar to Figure 14, except that in Figure 15 hardware partitions are provided instead of virtual partitions. As shown, the user applications are executed/stored within user application secured hardware execution partition 105 and secure enterprise mobile services application 125 is included within enterprise application secured hardware execution partition 106. Device 110 also includes secured hardware partition for OS 115 that includes secure hardware partition manager #1 107 for user application secured hardware execution partition 105 and secure hardware partition manager #2 108 for enterprise application secured hardware execution partition 106. As also shown, secured hardware partition for OS 115 includes OS network stack 116.

[00116] **Figure 16** illustrates a functional diagram of another secure device service processor architecture for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. As similarly described herein with respect to various embodiments, the device architecture of Figure 16 includes service processor framework program 139 (e.g., framework space agent/function) and network stack framework components 137 in operating system framework space 133, and service processor kernel program 138 (e.g., kernel space agent/function) and network stack kernel components 135 in operating system kernel space 132. In some embodiments, the service processor functions

provide a user interface function to communicate to a user of device 110 whether or not a service usage activity is an approved/authorized service usage activity, or whether it is a disallowed service usage activity for device 110 (e.g., the enterprise has disallowed the usage of device 110 for such service usage activities, such as online gaming and/or certain other online activities or certain long distance calling or voice usage during certain days, such as weekends) or whether such would/will be charged/billed to the user as a consumer under the user's consumer plan. In some embodiments, the service processor functions provide a user interface function to communicate to a user of device 110 an associated cost of certain service usage activities allocated to consumer service usage. In some embodiments, the service processor functions provide a user interface function to communicate to a user of device 110 an associated credit of certain service usage activities allocated to enterprise service usage. In some embodiments, the service processor functions provide a user interface function to communicate to a user of device 110 various other information as described herein with respect to providing an enterprise and consumer allocation for service usage activities. In some embodiments, the service processor shown in Figure 16 communicates with a service controller, such as described herein with respect to various embodiments.

Carrier Managed Billing Allocation With Device Mobile Enterprise Services Application Environment and Mobile Services Gateway Server With Service Usage Monitoring In Carrier Network And On Device

[00117] **Figure 17** illustrates a functional diagram of another network architecture 400 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 400 of Figure 17 is similar to network architecture 302 of Figure 10, except that as shown in Figure 17, device 110 also includes service usage monitor 119 (e.g., agent/function) in secure mobile enterprise application environment 120. In some embodiments, service usage monitor 119 performs application monitoring that includes counting application service usage for secure data application 124 and secure voice application 126 (and, in some embodiments, for also counting application service usage for user applications that are not enterprise or secure enterprise applications 124 or 126). In some embodiments, counting application service usage includes counting bytes or network connection time used in communicating via carrier access network

150 during the device's execution of monitored data applications. In some embodiments, counting application service usage includes counting voice network connection time used in communicating via carrier access network 150 during the device's execution of monitored voice applications. In some embodiments, service usage monitor 119 performs application monitoring that further includes classifying application service usage for secure enterprise applications 124, 126 (e.g., classifying various secure enterprise applications 124, 126 and in some embodiments, including ambient services classification/determination, by application/service usage activity such as based on application name or using signed code/hash techniques, by time of day/day of week, enterprise server, destinations, enterprise intranet, and/or other factors).

[00118] In some embodiments, carrier usage accounting server 154 communicates (e.g., using secure communication techniques) with service usage monitor 119 to mediate billing/charging and credit reports, for example, using the various approaches and techniques as described herein.

[00119] In some embodiments, service usage monitor 119 and/or another function/agent executed in secure mobile enterprise application environment 120 of device 110 blocks user access for non-enterprise activities that the user has not agreed to pay for.

[00120] Because the enterprise service usage is monitored by the device network elements in the embodiments depicted in Figure 17, various service accounting or billing policies are available to the enterprise or carrier. For example, the amount of service usage resulting from enterprise services that occur during roaming conditions may be accounted for even when the carrier network does not receive detailed classification of service usage from roaming network partners. The business rules programmed into service usage reconciliation function 158 that are determined by the enterprise service activity policy set can break-out enterprise service related roaming charges separate from consumer service related roaming charges. In addition, in some embodiments, the device secure mobile enterprise environment includes an access control function so that the access control policies specified in the enterprise service activity policy set can be enforced on roaming networks that have access that is not controlled by the carrier home network.

[00121] For example, the allowances provided by the enterprise service activity policy set can be programmed so that the allowances change depending on the availability of a particular

network or set of networks, the time of day, the congestion state of a network, or the current cost of service on the network. As another example, if the carrier home network is not available and only a roaming network is available, the allowance can be decreased or removed. As yet another example, if a certain network type is not available but another network type is (e.g., 2G is available instead of 3G or 3G is available instead of 4G), then the allocation can be reduced. As yet a further example, if a variable charging policy is in place with the carrier for access when the network is busy or during certain times of day, then the enterprise sponsored allowance can be reduced during times of higher charging. As described herein, in some embodiments, an active network detection function can be included on the device to assist the network policy enforcement to determine the type of network the device is connected to or to determine if the device is on a home or roaming network. As also described herein, in some embodiments, a network busy state monitor function can be included on the device to assist the network policy enforcement to determine the network busy state or state of network congestion.

Carrier Managed Billing Allocation With Device Mobile Enterprise Services Application Environment and Mobile Services Gateway Server With Service Usage Monitoring In Carrier Network, On Device, And In Enterprise Mobile Services Gateway Server

[00122] **Figure 18** illustrates a functional diagram of another network architecture 401 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 401 of Figure 18 is similar to network architecture 400 of Figure 17, except that in network architecture 401 of Figure 18, secure enterprise mobile services gateway/server 172 includes mobile server usage counter 179, and the enterprise service usage reports from this function are sent to service usage reconciliation function 158. In some embodiments, various specialized needs of monitoring, recording, and reporting enterprise service usage are confined to the special-purpose secure enterprise mobile services gateway/server 172.

Enterprise Managed Billing Allocation With Device Mobile Enterprise Services Application Environment and Mobile Services Gateway Server With Service Usage Monitoring On Device And In Enterprise Mobile Services Gateway Server

[00123] **Figure 19** illustrates a functional diagram of another network architecture 402 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 402 of Figure 19 is similar to network architecture 401 of Figure 18, except that network architecture 402 of Figure 19 does not include the service usage feed from carrier gateway/home agent 152, and service usage reconciliation function 158 relies solely on a device service usage feed from device 110 usage monitors 119 and secure enterprise mobile services gateway/server 172 mobile service usage monitor 179. In some embodiments, service usage reconciliation function 158 and enterprise service usage accounting server 159 are under the control of the enterprise or the carrier. For example, an enterprise entity can establish enterprise service and consumer service usage allocation accounting without the need to tie into the carrier network for usage feeds and usage accounting. Using various techniques described herein, an enterprise service usage credit can be determined, and the determined enterprise service usage credit can be reimbursed to the device user.

Enterprise Managed Billing Allocation With Device Mobile Enterprise Services Application Environment and Mobile Services Gateway Server With Service Usage Monitoring On Device

[00124] **Figure 20** illustrates a functional diagram of another network architecture 403 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 403 of Figure 20 is similar to network architecture 402 of Figure 19, except that in network architecture 403 of Figure 20, service usage reconciliation function 158 receives feeds from device 110 service usage monitors 119 and there is no feed from the secure enterprise mobile services gateway server.

Enterprise Usage Credit With Device Mobile Enterprise Services Application Environment and Mobile Services Gateway Server With Service Usage Monitoring On Device And In Enterprise Mobile Services Gateway Server

[00125] **Figure 21** illustrates a functional diagram of another network architecture 404 for providing enterprise and consumer billing allocation for wireless communication device service

usage activities in accordance with some embodiments. Network architecture 404 of Figure 21 is similar to network architecture 402 of Figure 19, except that in network architecture 404 of Figure 21, there is no service usage monitor function 119 in user services application environment 122 providing service usage reports/information to service usage reconciliation function 158, and enterprise usage accounting server 159 only generates enterprise usage records 156.

Enterprise Usage Credit With Device Mobile Enterprise Services Application Environment and Mobile Services Gateway Server With Usage Monitoring On Device

[00126] **Figure 22** illustrates a functional diagram of another network architecture 405 for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Network architecture 405 of Figure 22 is similar to network architecture 404 of Figure 21, except that network architecture 405 of Figure 22 does not include mobile server usage monitor 179 providing enterprise service usage reports/information to service usage reconciliation function 158.

Device Configurations With Service Usage Monitoring and Reporting

[00127] In some embodiments, secure enterprise mobile services application 125 and network stack 121 can be implemented in access modem 129, as described below with respect to Figures 23 through 26.

[00128] **Figure 23** illustrates a functional diagram of a secure device application architecture with device-based service usage monitoring (and in some embodiments, access control) for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Figure 23 is similar to Figure 13 except that in Figure 23 usage monitor 119 is provided as shown, and secure enterprise mobile services application 125 and network stack 121 can be implemented in access modem 129 as also shown.

[00129] **Figure 24** illustrates a functional diagram of a secure device virtual machine architecture with device-based service usage monitoring (and in some embodiments, access control) for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Figure 24 is similar to

Figure 14 except that in Figure 24, usage monitor 119 is provided as shown, and secure enterprise mobile services application 125 and virtual machine OS network stack 116 can be implemented in access modem 129 as also shown.

[00130] **Figure 25** illustrates a functional diagram of a secure device hardware execution partition architecture with device-based service usage monitoring (and in some embodiments access control) for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Figure 25 is similar to Figure 15 except that in Figure 25 usage monitor 119 is provided as shown, and secure enterprise mobile services application 125 and virtual machine OS network stack 116 can be implemented in access modem 129 as also shown.

[00131] **Figure 26** illustrates a functional diagram of a secure device service processor architecture with device based service usage monitoring (and in some embodiments, access control) for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. Figure 26 is similar to Figure 16 except that in Figure 26 usage monitor 119 is provided as shown, and secure enterprise mobile services application 125, service processor framework 139, and service processor kernel program 138, can be implemented in the access modem 129 as also shown.

[00132] In some embodiments, service processor framework program 139 (or service processor kernel program 138) interacts with network stack framework components 137 or network stack kernel components 135 to inspect traffic for service usage classification and service policy enforcement (e.g., access control policy enforcement, traffic control policy enforcement, service usage accounting, charging policy enforcement, or service notification policy enforcement) purposes. In some embodiments, one or more of network stack framework components 137 and network stack kernel components 135 provides classification information on one or more traffic flows to service processor framework program 139 (or service processor kernel program 138). In some embodiments, service processor framework program 139 (or service processor kernel program 138) seeks to match the classification information to one or more classification parameters contained in the service policy definitions in order to determine the service policy enforcement actions that may be required for a traffic flow. In some embodiments, a traffic flow

is a flow of data packets. In some embodiments, a traffic flow is a flow of one or more data packets that are associated with a device application, the association of a traffic flow to a device application being identified by network stack framework components 137 or network stack kernel components 135 or service processor framework program 139 (or service processor kernel program 138). In some embodiments, the service usage classification determines that the traffic flow is associated with a combination of one or more of: a device application, a network destination, a traffic type, a content type, a QoS level, a roaming network, a home network.

[00133] In some embodiments, the association of traffic flow to a specific device application is used to determine a service policy enforcement action that is dependent on the specific device application. In some embodiments, a specific device application identifier (e.g., an application name, application signature, application hash or application certificate) forms an application credential that is used to index a service policy enforcement action that is intended to be implemented following a service usage activity or attempted service usage activity by the specific device application. In some embodiments, a specific device application is verified as consistent with an application credential in order to ensure that an application service policy enforcement action intended to be applied to the specific device application is applied to the correct application. In some embodiments, the verification that a specific application is consistent with an application credential associated with a service policy enforcement action is performed in service processor framework program 139 (or service processor kernel program 138) to ensure that ensure that an application service policy enforcement action intended to be applied to the specific device application is applied to the correct application. In some embodiments, the verification that a specific application is consistent with an application credential associated with a service policy enforcement action is performed in network stack framework components 137 or network stack kernel components 135, and service processor framework program 139 (or service processor kernel program 138) ascertains the application credential verification to ensure that ensure that an application service policy enforcement action intended to be applied to the specific device application is applied to the correct application.

[00134] In some embodiments, the association of traffic flow to a specific device application is used to determine a service policy enforcement action that is dependent on the specific device application, and service processor framework program 139 (or service processor kernel program

138) instructs network stack framework components 137 or network stack kernel components 135 to implement the service policy enforcement action on the traffic flow associated with the specific device application. In some embodiments, the association of traffic flow to a specific device application is used to determine a service policy enforcement action that is dependent on the specific device application, and service processor framework program 139 (or service processor kernel program 138) implements the service policy enforcement action. In some embodiments, a traffic flow is buffered pending classification (e.g., buffered in one or more of network stack framework components 137, network stack kernel components 135, service processor framework program 139, or service processor kernel program 138). In some embodiments, upon classification of the traffic flow (e.g., determination of an association of the traffic flow to a specific device application), a service policy enforcement action that is dependent on the specific device application is determined by service processor framework program 139 (or service processor kernel program 138) and implemented in one or more of network stack framework components 137, network stack kernel components 135, service processor framework program 139, and service processor kernel program 138. In some embodiments, the service policy enforcement action for the traffic flow is implemented in service processor framework program 139 (or service processor kernel program 138). In some embodiments, service processor framework program 139 (or service processor kernel program 138) instructs a device UI program that displays a device service notification (e.g., a service usage notification, a service plan offer notification, or an indication of a service usage event or attempted service usage event that requires a user notification) to implement the service policy enforcement action for the traffic flow. In some embodiments, service processor framework program 139 (or service processor kernel program 138) instructs a service usage monitor (e.g., accounting traffic to bulk classification or a more detailed classification of service usage) to implement the service policy enforcement action for the traffic flow.

[00135] In some embodiments, the network destination of a traffic flow is used to determine if a service policy enforcement action that is dependent on a specific network destination should be applied to the traffic flow. In some embodiments, a traffic flow is inspected by network stack framework components 137 or network stack kernel components 135, and one or more traffic characteristics (e.g., an address, a socket/flow tuple, a layer-7 packet information, or a packet header string) are passed to service processor framework program 139 (or service processor

kernel program 138), wherein the one or more traffic characteristics are matched against one or more classification parameters contained in a service policy definition, and if a match is present then a service policy enforcement action is implemented for the traffic flow. In some embodiments, a traffic flow is inspected by service processor framework program 139 (or service processor kernel program 138), and one or more traffic characteristics (e.g., an address, a socket/flow tuple, a layer-7 packet information, or a packet header string) are matched against one or more classification parameters contained in a service policy definition, and if a match is present then a service policy enforcement action is implemented for the traffic flow. In some embodiments, the service policy enforcement action for the traffic flow is implemented in service processor framework program 139 (or service processor kernel program 138). In some embodiments, service processor framework program 139 (or service processor kernel program 138) instructs network stack framework components 137 or network stack kernel components 135 to implement the service policy enforcement action for the traffic flow. In some embodiments, the service policy enforcement action for the traffic flow is implemented by a device UI program that displays a device service notification (e.g., a service usage notification, a service plan offer notification, or an indication of a service usage event or attempted service usage event that requires a user notification). In some embodiments, the service policy enforcement action for the traffic flow is implemented by a service usage monitor (e.g., accounting traffic to bulk classification or a more detailed classification of service usage).

[00136] In some embodiments, an enterprise manger can define or select service plan policies that confine enterprise-sponsored access services to a pre-defined list of device applications. For example, an enterprise manager might choose to define or select a service plan wherein only corporate applications may be accessed (e.g., email, contacts, intranet services, text, and/or voice). In such embodiments, enterprise service design user interface 196 may be used by the enterprise manager to define or select the allowable applications that are to have access. In some embodiments, an enterprise access manager may define or select a different set of applications to be accessible when device 110 is roaming than when device 110 is on a home network or on a WiFi network. In some embodiments, an enterprise manager may define or select a set of applications that are to be not allowed access when a device is on a certain network (e.g., a roaming network). For example, many modern smart phone, tablet, and laptop operating systems have background services that have the potential to incur large roaming charges during

roaming conditions (e.g., Google Android "gallery" functions that share device data with the Google network, Microsoft "system" functions that do the same, software update programs, etc.). In such cases, enterprise service design center 194 may be used to specify the device applications that are not allowed to access the network during certain network conditions.

[00137] In some embodiments, the identification and network access control for a device application is performed with a device software program or agent (e.g., service processor framework program 139 or service processor kernel program 138), and enterprise service design center 194 programs the device agent with the application identification parameters and associated access policies. In some embodiments, the device agent identifies the application using an application name, certificate, signature, or hash for an application running on the device and a policy instruction stored on the device.

[00138] In some embodiments, the identification and network access control for a device application is performed with one or more network access policy enforcement elements (e.g., carrier gateway/home agent 152, carrier usage accounting server 154, enterprise firewall/security gateway 171), and enterprise service design center 194 causes the one or more network access policy enforcement elements to be provisioned with the application identification parameters and associated access policies. In some embodiments, the one or more network access policy enforcement elements identify an application by observing the traffic headers inserted by the application. In some embodiments, the one or more network access policy enforcement elements identify an application by observing the network destinations or destination patterns accessed by the application. In some embodiments, the one or more network access policy enforcement elements identify an application by routing or tunneling the application traffic to one or more network gateways or servers associated with the application (e.g., APN routes, dedicated application addressing, or a device agent that steers the application traffic to a server). In some embodiments, the device assists in this routing or tunneling with a device agent that is programmed to route or re-direct the traffic for an application.

[00139] In some embodiments, an enterprise manger can define or select service plan policies that confine enterprise-sponsored access services to a pre-defined list of network destinations, servers, or resources. For example, an enterprise manager might choose to define or select a

service plan wherein only corporate network destinations may be accessed (e.g., email server, contacts server, intranet servers, text service servers, and VOIP servers). In some embodiments, enterprise service design center interface 196 may be used by an enterprise manager to define or select the allowable network destinations that device 110 may access. In some embodiments, the enterprise access manager may define or select a different set of network destinations when device 110 is roaming than when device 110 is on a home network or on a WiFi network. In some embodiments, an enterprise manager may define or select a set of network destinations that device 110 cannot access when device 110 is on a certain network (e.g., a roaming network). For example, many websites and enterprise services exhibit network access service usage behavior that can incur large roaming charges during roaming conditions (e.g., software update websites or servers, contact database synchronization websites, email download synchronization websites, video conference websites, etc.). In such cases, enterprise service design center 194 may be used to specify the device applications, services, and/or websites that are not to be accessed or used during certain network connection conditions.

[00140] In some embodiments, a device agent identifies the network destination and applies the appropriate access policy by comparing traffic characteristics with pre-defined characteristics in the access policy instructions provisioned on device 110, and then applies the corresponding traffic control rule, and enterprise service design center 194 performs the provisioning of the device agent. In some embodiments, the identification and network access control for a network destination is performed with one or more network access policy enforcement elements (e.g., carrier gateway/home agent 152, carrier usage accounting server 154, enterprise firewall/security gateway 171) and enterprise service design center 194 performs the provisioning of the one or more network elements.

[00141] In some embodiments, enterprise service design center 194 is configured to receive or accept a specification for an access network service usage limit (e.g., a service amount in minutes, bytes, or cost) for a service usage activity (such as a data service, a voice service, a text service, a roaming service, or a more detailed classification of data service such as one or more websites or one or more device applications), and the service usage limit is applied to one or more devices 110 or device groups (or users or user groups) managed by enterprise service design center 194. In some embodiments, enterprise service design center 194 is further

configured to receive service usage records for device 110, which is managed by enterprise service design center 194, from a device-based element that monitors and reports device 110 service usage (e.g., one or more device usage monitors 119, device service processor framework program 139, or service processor kernel program 138, network stack 134, or access modem 151), and when the usage limit is reached a service usage notification message is generated. In some embodiments, enterprise service design center 194 is configured to deliver the service usage notification message to enterprise service design center UI 196. In some embodiments, enterprise service design center 194 is configured to deliver the service usage notification message to a device 110 software application (e.g., service processor framework program 139 or user data app 111) for presentation to the device user via a user interface.

[00142] In some embodiments, enterprise service design center 194 is configured to receive or accept a specification for an access network service usage limit (e.g., a service amount in minutes, bytes, or cost) for a service usage activity (such as a data service, a voice service, a text service, a roaming service, or a more detailed classification of data service such as one or more websites or one or more device applications), and the service usage limit is applied to one or more devices 110 or device groups (or users or user groups) managed by enterprise service design center 194. In some embodiments, enterprise service design center 194 is further configured to receive service usage records for device 110, which is managed by the enterprise service design center 194, from a device-based element configured to monitor and report device 110 service usage (e.g., one or more device usage monitors 119, device service processor framework program 139 or service processor kernel program 138, network stack 134, or access modem 151), and when the usage limit is reached a restriction or limitation on further usage is applied by the service design center by provisioning one or more network elements responsible for enforcing network access policy (e.g., carrier gateway/home agent 152, carrier usage accounting server 154, enterprise firewall/security gateway 171). In some embodiments, enterprise service design center 194 is configured to send the user a notification message or a message to contact an enterprise manager.

[00143] In some embodiments, secure network interface 128 on device 110 is configured with a VPN device client function to securely communicate between one or more approved enterprise applications (e.g., enterprise data app 124, enterprise voice app 126, secure enterprise mobile

services app 125) and a counterpart VPN function that secures access to enterprise network 170 (e.g., enterprise firewall/security gateway 171 or server secure network interface 127). In some embodiments, a device software application or agent (e.g., service processor framework program 139 or service processor kernel program 138, secure network interface 128, secure hardware partition manager 108) is configured to identify network access activity associated with individual applications and allow network access to one or more approved enterprise applications when a VPN device client function is in operation, or not allow network access to one or more approved enterprise applications when a VPN device client function is not in operation. In some embodiments, service design center 190 or enterprise service design center 194 is configured to provision a device 110 software application or agent (e.g., service processor framework program 139 or service processor kernel program 138, secure network interface 128, secure hardware partition manager 108) with application access policy rules to identify network access activity associated with individual applications and allow network access to one or more approved enterprise applications when a VPN device client function is in operation, or not allow network access to one or more approved enterprise applications when a VPN device client function is not in operation. In this manner, enterprise applications that might be subject to spoofing by network elements, websites, servers, or programs operating outside the secure enterprise environment are not placed in communication with such network elements.

[00144] In some embodiments, a device software application or agent (e.g., service processor framework program 139 or service processor kernel program 138, secure network interface 128, secure hardware partition manager 108) is configured to identify network access activity associated with individual applications and not allow network access to one or more non-approved applications when a VPN device client function is in operation, or allow network access to one or more non-approved applications when a VPN device client function is not in operation. In some embodiments, service design center 190 or enterprise service design center 194 is configured to provision a device 110 software application or agent (e.g., service processor framework program 139 or service processor kernel program 138, secure network interface 128, secure hardware partition manager 108) with application access policy rules to identify network access activity associated with individual applications and not allow network access to one or more non-approved applications when a VPN device client function is in operation, or allow network access to one or more enterprise applications when a VPN device client function is not

in operation. In this manner, applications that might maliciously access enterprise network resources when the VPN is running are not permitted to do so.

[00145] In some embodiments, the application access policy rules are enforced by allowing or not allowing an application to access the network. In some embodiments, the application access policy rules are enforced by allowing or not allowing the application to run. In some embodiments, the identification of approved enterprise applications associated with traffic flows is confirmed or secured by identifying the application certificate and comparing it to an application signature or hash on the device. In some embodiments, the identity of an approved enterprise application is confirmed by inspecting an application certificate, signature or hash that is provided by service design center 190 or enterprise service design center 194.

[00146] In some embodiments, secure network interface 128 is configured with a split-tunnel VPN device client function, wherein an enterprise side of the split tunnel is configured to securely communicate between one or more enterprise applications (e.g., enterprise data app 124, enterprise voice app 126, secure enterprise mobile services app 125) and a counterpart VPN function that secures access to the enterprise network 170 (e.g., enterprise firewall/security gateway 171 or server secure network interface 127), and a consumer side of the split tunnel is configured to communicate without encryption for access network services provided to consumer applications on the device. In some embodiments, a device software application or agent (e.g. service processor framework program 139 or service processor kernel program 138, secure network interface 128, secure hardware partition manager 108) is configured to identify network access activity associated with individual applications and route or direct traffic associated with one or more enterprise applications to the enterprise side of the split VPN tunnel, and route or direct traffic associated with one or more consumer applications to the consumer side of the VPN tunnel. In some embodiments, service design center 190 or enterprise service design center 194 is configured to provision a device 110 software application or agent (e.g., service processor framework program 139 or service processor kernel program 138, secure network interface 128, secure hardware partition manager 108) with application access policy rules to identify network access activity associated with individual applications and specify which applications are to be routed or directed to the enterprise side of the VPN tunnel and which applications are to be routed or directed to the consumer side of the VPN tunnel. In some

embodiments, the identification of applications associated with traffic flows is secured by identifying the application certificate and comparing it to an application signature or hash on the device. In some embodiments, the application certificate, signature or hash is provided by service design center 190 or enterprise service design center 194.

[00147] In some embodiments, the policy rules only enable secure applications on device 110 to access enterprise data. In some embodiments, an enterprise manager sets policy rules that do not allow secure applications on device 110 to upload data to unsecure destinations.

[00148] In some embodiments, service design center 190 is configured to provide enterprise service design center 194. In some embodiments, enterprise service design center 194 comprises a policy management system configured to select a set of access network policies to be enforced for one or more device groups (or user groups) where the set of access network policies consists of a subset of the full set of access network policies capable of being enforced by the access network policy enforcement elements. In some embodiments, the subset of the full set of policies capable of being enforced by the access network policy enforcement elements comprises a pre-defined subset of the policy configuration capabilities. In some embodiments, the enterprise service design center policy management subset limitations for enterprise service design center 194 provide the ability to define and manage one or more of the policies that define a service policy set or service plan that is applied to a given device, user, device group or user group. In some embodiments, the enterprise service design center policy management subset limitations for enterprise service design center 194 can provide the ability to enroll a device, user, device group or user group in a set limited to one or more pre-defined service policy configurations or service plans.

[00149] As an example embodiment, the enterprise service design center policy management subset limitations for enterprise service design center 194 may provide the following policy definition and management capabilities for a device (or user) or device group (or user group): specify service usage limits (caps) for bulk access service or for a specific classification of access service activities, require all traffic or certain traffic associated with enterprise-critical applications or content to be communicated via an enterprise VPN, define controls for which applications that can access the network or certain defined destinations on the network, specify

network destinations that are allowed or not allowed, specify roaming service limitations, specify WiFi networks that are allowed or not allowed, specify security settings in the device access control or I/O access control ports, specify service usage notification triggers and notification content associated with the triggers (e.g., warnings when a specified service usage activity occurs, access is not allowed for a given attempted service usage activity, or service usage reaches a limit), and other such examples that are allowed to be managed under the policy management subset limitations. In some embodiments, the charging rates for such services may not be allowed to be managed under the policy management subset limitations.

[00150] In some embodiments, enterprise service design center 194 has an allowable subset of the full set of policies capable of being enforced by the access network policy enforcement elements that comprises a pre-defined set of one or more access network policy configurations (e.g., service plans). As an example embodiment, the set of pre-configured service plans may be defined for a certain implementation of enterprise service design center 194 comprising multiple pre-defined service plans, each of which provides variations in one or more of service notification policy, access control policy, service classification policy, service QoS policy, or service charging policy.

[00151] In some embodiments, enterprise service design center 194 is configured to allow a service design administrator to select one or more pre-configured access network policy configurations (or service plans) to be applied to a device, a user, a device group or a user group.

[00152] In some embodiments, enterprise service design center 194 comprises a device enrollment management system configured to enroll a device credential into a device group (or a user credential into a user group), where the set of device credentials (or user credentials) that enterprise service design center 194 is capable of managing is a subset of the device credentials (or user credentials) allowed on the access network. In some embodiments, the subset of device credentials (or user credentials) that are subject to management by enterprise service design center 194 is defined using service design center 190.

[00153] As an example embodiment, the set of pre-defined service plans that are made available to a first enterprise service design center 194 implementation managed by a first enterprise entity might consist of three service plans, wherein the first service plan comprises

network policies (e.g., access policies, charging policies, or notification policies) that provide for limited or restricted home network access service but do not provide for roaming access services, the second service plan comprises network policies that provide for unlimited or unrestricted home network access service and also provide for limited roaming access services, and the third service plan comprises network policies that provide for unlimited or unrestricted home network access service and also provide for unlimited or unrestricted roaming access services. In another example embodiment, on the same carrier access network as the previous example, a second enterprise service design center 194 implementation managed by a second enterprise entity might consist of two service plans, wherein the two service plans might be the same as two of the service plans from the previous example embodiment, or they might be completely different.

[00154] Given these examples, it will now be understood and appreciated by one of ordinary skill in the art that enterprise service design center 194 provides a convenient means of designing and distributing custom service plans to different enterprise entities that meet the needs of each enterprise entity, wherein the various policy definition capabilities disclosed herein can be used in a large number of combinations to create the service plans, with the number of combinations of service plan design capabilities being too numerous to list here. It will also now be understood and appreciated by one of ordinary skill in the art that each enterprise can effectively manage its devices (or users) and device groups (or user groups) to provide the appropriate level of policy control needed by the enterprise in a simplified manner, without the need to manage all the full policy capabilities of the access network.

[00155] For example, the embodiments of service design center 190 and enterprise service design center 194 disclosed herein support a carrier network business process wherein a carrier network manager utilizes service design center 190 to create a set of access network policies that consist of a subset of the full set of access network policies capable of being enforced by the access network policy enforcement elements (referred to as specialized enterprise service plans), and the specialized enterprise service plans are designed and offered to meet the special needs of one or more enterprise entities. In some embodiments, an enterprise manager uses enterprise service design center 194 to apply the one or more specialized enterprise service plans to one or more devices (or users) or device groups (or user groups) that belong to the enterprise entity's mobile device inventory (or employee list). The different needs of various employee groups (or

device types) can be among the factors that determine which service plan is assigned to a given user group (or device group). The specific needs of an employee can assist in determining which user group (or device group) the employee should be assigned to. The carrier manager can also create other specialized enterprise service plans for other enterprise entities to meet varied needs among enterprise market customers.

[00156] In some embodiments, an enterprise manager controls access network usage, costs, and access limits for an employee user group (e.g., a group of devices that could be as small as a single device or as large as all devices under the enterprise manager's control). In some embodiments, the enterprise manager establishes at least two user groups and establishes and manages different network-access policies for different employee user groups. For example, the enterprise manager may set and manage different policies for data usage on WiFi, 3G, 4G, or other networks for different employee user groups. Likewise, the enterprise manager may set different roaming privileges for different employee user groups.

[00157] In some embodiments, an enterprise manager sets expenditure ceilings by limiting allowed data usage for secure business applications to enforce security rules. In some embodiments, an enterprise manager tracks enterprise data access to improve compliance records. For example, the enterprise manager can track enterprise data usage by employee, device, application, location, network, or time of day.

[00158]

Process Flows For Providing Enterprise And Consumer Billing Allocation For Wireless Communication Device Service Usage Activities

[00159] **Figure 27 i**llustrates a flow diagram for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. At 402, the process begins. At 404, a service usage activity of a wireless communication device (e.g., application based service usage that uses a wireless network in which the wireless communication device has an associated service plan) is performed. In some embodiments, the monitoring is performed on the wireless communication device. In some embodiments, the monitoring is performed by a network element, such as a secure application

server for monitoring enterprise applications, as described herein with respect to various embodiments. At 406, an enterprise/consumer allocation is determined. In some embodiments, the monitored service usage activity is reported to a network element that determines the enterprise/consumer allocation based on the associated service plan that includes a defined enterprise/consumer allocation based on various factors, such as can be performed by a carrier billing server as described herein with respect to various embodiments. At 408, an associated consumer account is billed for the consumer service usage. At 410, the consumer account is credited for the enterprise service usage. At 412, the process is completed.

[00160] **Figure 28** illustrates another flow diagram for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. At 502, the process begins. At 504, a service usage activity of a wireless communication device (e.g., application based service usage that uses a wireless network in which the wireless communication device has an associated service plan) is performed. At 506, an enterprise/consumer allocation is determined. At 508, an associated enterprise account is billed for the enterprise service usage. At 510, the enterprise account is credited for the consumer service usage. At 512, the process is completed.

[00161] **Figure 29** illustrates another flow diagram for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. At 602, the process begins. At 604, a service usage activity of a wireless communication device (e.g., application based service usage that uses a wireless network in which the wireless communication device has an associated service plan) is performed. At 606, an enterprise/consumer allocation is determined. At 608, the enterprise service usage is reported. At 610, an expense reimbursement for the enterprise service usage is generated (e.g., by the enterprise for the consumer, who is, for example, an employee of the enterprise). At 612, the process is completed.

[00162] **Figure 30** illustrates another flow diagram for providing enterprise and consumer billing allocation for wireless communication device service usage activities in accordance with some embodiments. At 702, the process begins. At 704, a service usage activity of a wireless communication device (e.g., application based service usage that uses a wireless network in

which the wireless communication device has an associated service plan) is performed. At 706, the monitored service usage is reported. At 708, an enterprise/consumer allocation is determined. At 710, a bill/charge based on the enterprise/consumer allocation is generated. At 712, the process is completed.

[00163] 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. In particular, many of the embodiments are not limited to supporting an enterprise/consumer split. As would be appreciated by one of ordinary skill in the art, the disclosed embodiments may be applied, for example, when a sponsor entity subsidizes a cost associated with an end-user device's use of a sponsored (or ambient) data service or application, and the user pays for the end-user device's use of non-sponsored (or non-ambient) data services or applications. The sponsor entity may use enterprise service design center 194 to configure devices that may use the sponsored service, policies applicable to the sponsored service, etc. Moreover, the disclosed embodiments may be applied when a first sponsor subsidizes a cost associated with an end-user device's use of a first sponsored data service or application, a second sponsor subsidizes a cost associated with the end-user device's use of a second sponsored data service or application, and the user pays for the end-user device's use of non-sponsored data services or applications. The sponsor entities may use one or more enterprise service design centers to configure aspects of the sponsored services. As would be appreciated by one of ordinary skill in the art, there are many other environments in which the disclosed embodiments are useful or applicable.

[00164] Several advantageous combination embodiments are now disclosed for allocating enterprise service usage accounting and personal service usage accounting. These combinations are for example purposes, are not meant to be exhaustive or limiting in any way; as will be apparent to one of ordinary skill in the art, these combinations represent only a fraction of the embodiments provided herein.

[00165] In some embodiments, a network system for classifying the accounting of access network service usage for an end user device comprises (i) a first service design center

configured to receive an accounting split classification policy defining the classification rules for dividing an overall access network service usage into an enterprise service usage allocation and a personal service usage allocation, (ii) a network provisioning instruction translator configured to receive the accounting split classification policy and translate it to a set of network service usage classification and reporting instructions for one or more network elements responsible for classifying service usage, (iii) a network provisioning system for communicating the set of network service usage classification and reporting instructions to the one or more network elements responsible for classifying service usage, (iv) the one or more network elements responsible for classifying service usage configured to classify service usage to determine the enterprise service usage allocation and the personal service usage allocation, and generate service usage reports, and (v) a service usage accounting system that receives the service usage reports and (a) accrues the enterprise service usage allocation, and (b) accrues the personal service usage allocation.

[00166] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the first network access notification message policy is associated with a first device group defined by a first list of device credentials or a first user group defined by a first list of user credentials, and the service design center is further configured to obtain a second network access notification message policy comprising a plurality of second network access trigger conditions and, for each of the plurality of second network access trigger conditions, an associated second network access notification message, the second network access notification message policy associated with a second device group defined by a second list of device credentials or a second user group defined by a second list of user credentials.

[00167] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device further comprises a master service design center configured to define a first notification policy design capability set for the first service design center, the first notification policy design capability set comprising a first subset of a master policy capability set. This embodiment can be further augmented wherein the master service design center is further configured to define a second notification policy design capability set for a second service design center, the second notification policy design capability set comprising a

second subset of the master policy capability set, the second subset of the master policy capability set either identical to or different from the first subset of the master policy capability set.

[00168] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device is further augmented wherein the first service design center is hosted on an operator network. In some embodiments, the network system for classifying the accounting of access network service usage for an end user device is optimized for smaller enterprise data center deployments wherein the first service design center is hosted on an enterprise business network.

[00169] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the enterprise service usage allocation comprises a classification of service usage that specifies one or more enterprise device software applications. In some embodiments, the enterprise applications can be one or more of email, calendar, contacts, enterprise intranet (e.g., a secure intranet browser with a secure SSL connection or other secure connection to enterprise services), mobile device synchronization or mobile enterprise communications.

[00170] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the enterprise service usage allocation comprises a classification of service usage that specifies one or more enterprise network destinations.

[00171] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the enterprise service usage allocation comprises a classification of service usage that specifies one or more enterprise network destinations and the one or more enterprise network destinations comprise an address or identifier for a secure enterprise gateway. In some embodiments, the enterprise gateway comprises a VPN server.

[00172] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the enterprise service

usage allocation comprises a classification of service usage that specifies one or more enterprise network destinations and the one or more enterprise network destinations comprise an address or identifier for one or more secure enterprise mobile services gateways or servers comprising one or more of an email server, a calendar server, a contacts server, an enterprise intranet access server, a mobile device synchronization services server or a mobile enterprise communication server.

[00173] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the one or more network elements responsible for classifying service usage and generating service usage reports comprises a service usage monitor located in a wireless operator network.

[00174] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the one or more network elements responsible for classifying service usage and generating service usage reports comprises a service usage monitor located in an enterprise access network.

[00175] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the one or more network elements responsible for classifying service usage and generating service usage reports comprises a service usage monitor located on a wireless device.

[00176] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the service usage accounting system is located in an enterprise network.

[00177] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the service usage accounting system is managed by an enterprise manager under the control of the entity that manages an enterprise business.

[00178] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the service usage accounting system is located in an operator network.

[00179] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the service usage accounting system is managed by an operator manager under the control of the entity that manages a network operator.

[00180] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the service usage accounting system is further configured to credit a user account with a service usage credit or monetary credit associated with the accrued enterprise service usage allocation.

[00181] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the service usage accounting system is further configured to debit a user account with a service usage debit or monetary cost associated with the accrued personal service usage allocation.

[00182] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the service usage accounting system is further configured to credit an enterprise account with a service usage credit or monetary credit associated with the accrued personal service usage allocation.

[00183] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented wherein the service usage accounting system is further configured to debit an enterprise account with a service usage debit or monetary cost associated with the accrued enterprise service usage allocation.

[00184] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device can be augmented by further configuring the service design center to: (i) receive a personal service plan offer comprising one or more service plans for personal network access services accounted to the personal service usage allocation, (ii) configure a device user interface service plan offer notification message, (iii) communicate the device user interface service plan offer notification message to one or more device groups comprising a collection of devices identified by device credentials, (iv) receive a service plan selection option from an end user device user in response to the device user interface service plan

offer notification message, and (v) cause one or more network elements responsible for activating service plans to activate the service plan selection chosen by the end user device user.

[00185] In some embodiments the end-user device system in communication with the network system for classifying the accounting of access network service usage comprises: (i) a device software application environment comprising: (a) an enterprise application execution environment configured with: (1) an enterprise application execution memory and data memory to support secure execution of enterprise software applications, the enterprise software applications comprising applications approved to execute in the secure execution environment and to communicate with secure enterprise services, (2) a secure enterprise communication link configured to provide communication between the enterprise software applications and enterprise network services, the enterprise network services comprising enterprise network resources and servers, (b) a personal application execution environment configured with execution memory and data memory to support execution of personal software applications not approved to execute in the secure execution environment, (ii) a personal service plan selection user interface comprising a notification software agent configured to receive personal service plan offer from a network element and display the service plan offers, the personal service plan offer comprising one or more service plans for personal network access services accounted to a personal service usage allocation, and receive a service plan selection option from an end user device user and forward the service plan selection option to a network element.

[00186] In some embodiments, the end-user device system can be augmented wherein the secure enterprise communication link comprises a VPN client in communication with an enterprise VPN gateway.

[00187] In some embodiments, the end-user device system can be augmented wherein the enterprise network services comprise access to one or more secure enterprise mobile services gateways or servers comprising one or more of an email server, a calendar server, a contacts server, an enterprise intranet access server, a mobile device synchronization services server or a mobile enterprise communication server.

[00188] In some embodiments, the end-user device system can be augmented wherein the enterprise application execution environment is further configured to: (i) acquire a device

software application signature prior to allowing execution of the device software application in the virtual machine operating environment, (ii) compare the signature to an approved list of signatures, (iii) allow the application to execute if it is on the list, and (iv) not allow the application to execute if it is not on the list.

[00189] In some embodiments, the end-user device system can be augmented wherein enterprise application execution environment comprises a virtual machine operating environment.

[00190] In some embodiments, the end-user device system can be augmented wherein enterprise application execution environment comprises a secure CPU hardware execution partition.

[00191] In some embodiments, the end-user device system can be augmented wherein enterprise application execution environment comprises a secure operating system execution partition.

[00192] In some embodiments, the end-user device system can be augmented wherein enterprise application execution environment comprises a secure memory area protected by an enterprise application software program that encrypts the enterprise data stored on device memory and runs a secure encrypted communication protocol for communication with a secure mobile enterprise services gateway server.

[00193] Several advantageous combination embodiments are now disclosed for providing enterprise control of network access service to an end user device. These combinations are for example purposes, are not meant to be exhaustive or limiting in any way; as would be appreciated by one of ordinary skill in the art, these combinations represent only a fraction of the advantageous embodiment combinations provided herein.

[00194] In some embodiments, a network system for providing network access service control for an end user device comprising: (i) a first service design center configured to receive from an administrator user or a configuration file a first network access policy comprising a first set of network access service permissions associated with an end user device or end user device user, (ii) a network provisioning instruction translator configured to receive the first network access

policy and translate it to a set of network access policy enforcement instructions for one or more network elements responsible for controlling network access, (iii) a network provisioning system for communicating the set of network access policy enforcement instructions to the one or more network elements responsible for controlling network access, (iv) the one or more network elements responsible for controlling network access configured to execute the set of network access policy enforcement instructions to enforce network access service permissions and limits.

[00195] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy is associated with a first device group defined by a first list of device credentials or a first user group defined by a first list of user credentials, and the service design center is further configured to obtain a second network access policy comprising a second set of network access service permissions and, the second network access policy associated with a second device group defined by a second list of device credentials or a second user group defined by a second list of user credentials.

[00196] In some embodiments, the network system for classifying the accounting of access network service usage for an end user device further comprises a master service design center configured to define a first network access policy design capability set for the first service design center, the first network access policy design capability set comprising a first subset of a master policy capability set. This embodiment can be further augmented wherein the master service design center is further configured to define a second network access policy design capability set for a second service design center, the second network access policy design capability set comprising a second subset of the master policy capability set, the second subset of the master policy capability set either identical to or different from the first subset of the master policy capability set.

[00197] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy defines a set of one or more service usage limits or service cost limits.

[00198] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy defines a set of one or more roaming network service usage limits or service cost limits.

[00199] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy defines a set of one or more network type restrictions, wherein a network type comprises one or more of a cellular network, a 2G network, a 3G network, a 4G network, a WiFi network, a particular WiFi network APN, roaming cellular network, a particular cellular operator network.

[00200] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy defines a set of one or more device application software network access restrictions.

[00201] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy defines a set of one or more network destination access restrictions.

[00202] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy defines a set of one or more enterprise network destination allowances or restrictions.

[00203] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy defines a set of one or more enterprise network destination allowances or restrictions communicated over a secure VPN communication link.

[00204] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy defines a set of one or more application or network destination allowances or restrictions communicated over a non-secure communication link.

[00205] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy defines a set of one or more personal application or network destination allowances or restrictions.

[00206] In some embodiments, the network system for providing network access service control can be augmented wherein the first network access policy defines a set of one or more geographic location allowances or restrictions.

[00207] In some embodiments, the network system for providing network access service control can be augmented wherein the one or more network elements responsible for controlling network access comprises a service usage monitor located in a wireless operator network.

[00208] In some embodiments, the network system for providing network access service control can be augmented wherein the one or more network elements responsible for controlling network access comprises a service usage monitor located in an enterprise access network. In some embodiments, the one or more network elements responsible for controlling network access comprises a service usage monitor located in an enterprise access network comprise a VPN gateway wherein all device traffic is communicated from the device to the VPN gateway configured to control the device traffic. In some embodiments, the VPN gateway performs service usage classification to identify and control enterprise traffic. In some embodiments, the VPN gateway performs service usage classification to identify and control personal traffic.

[00209] In some embodiments, the network system for providing network access service control can be augmented wherein the one or more network elements responsible for controlling network access comprises a service usage monitor located on a wireless device.

INCORPORATION BY REFERENCE

[00210] The following U.S. applications are hereby incorporated by reference for all purposes: Application No. 13/248,028, filed September 28, 2011, entitled ENTERPRISE ACCESS CONTROL AND ACCOUNTING ALLOCATION FOR ACCESS NETWORKS; Application No. 12/380,780, entitled AUTOMATED DEVICE PROVISIONING AND ACTIVATION, filed March 2, 2009; Application No. 12/380,778, filed March 2, 2009, entitled VERIFIABLE DEVICE ASSISTED SERVICE USAGE BILLING WITH INTEGRATED ACCOUNTING, MEDIATION ACCOUNTING, AND MULTI-ACCOUNT; Provisional Application No. 61/206,354, entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD, filed January 28, 2009; Provisional Application No. 61/206,944, entitled

SERVICES POLICY COMMUNICATION SYSTEM AND METHOD, filed February 4, 2009; Provisional Application No. 61/207,393, entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed February 10, 2009; Provisional Application No. 61/207,739, entitled SERVICES POLICY COMMUNICATION SYSTEM AND METHOD filed February 13, 2009; and Provisional Application No. 61/387,243, entitled ENTERPRISE AND CONSUMER BILLING ALLOCATION FOR WIRELESS COMMUNICATION DEVICE SERVICE USAGE ACTIVITIES filed September 28, 2010.

CLAIMS

1. A network system for providing network access service notification messages containing information about a network access activity of an end-user device, the network system comprising:

a first service design center configured to:

obtain a first network access notification message policy comprising a first network access trigger condition and an associated first network access notification message, the first network access trigger condition comprising one or more current or requested end-user device network access activities, the first network access notification message comprising notification information to be presented to a user through a user interface,

receive a trigger condition indication from a network element,

associate the trigger condition indication with the first network access notification message, and

present the notification information to the user through the user interface;

a network provisioning instruction translator configured to:

receive, from the first service design center, the first network access trigger condition, and

determine, based on the first network access trigger condition, one or more network access trigger identification instructions; and

a network provisioning system configured to communicate the one or more network access trigger identification instructions to one or more network elements responsible for monitoring the service usage, the one or more network elements responsible for monitoring the service usage configured to:

execute the one or more network access trigger identification instructions to identify when the first network access trigger condition occurs, and

send the trigger condition indication to the first service design center.

ABSTRACT OF THE DISCLOSURE

Enterprise and consumer billing allocation for wireless communication device service usage activities is provided. In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes monitoring a service usage activity of a wireless communication device, and determining an enterprise and consumer billing allocation for the monitored service usage activity. In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes monitoring a service usage activity of a wireless communication device, and reporting the monitored service usage activity to a network element, in which the network element determines an enterprise and consumer billing allocation for the monitored service usage activity. In some embodiments, enterprise and consumer billing allocation for wireless communication device service usage activities includes providing a service design center for configuring an enterprise and consumer billing allocation of monitored service usage activities for a plurality of wireless communication devices associated with an enterprise account, and implementing the configured enterprise and consumer billing allocation for monitored service usage activities for the plurality of wireless communication devices associated with the enterprise account.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP037D1C1C1C1C1
	Application Number	
Title of Invention	Enterprise Access Control and Accounting Allocation for Access Networks	

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.
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP037D1C1C1C1C1
	Application Number	
Title of Invention	Enterprise Access Control and Accounting Allocation for Access Networks	

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Title of the Invention	Enterprise Access Control and Accounting Allocation for Access Networks		
Attorney Docket Number	RALEP037D1C1C1C1C1	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	28	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP037D1C1C1C1C1
	Application Number	
Title of Invention	Enterprise Access Control and Accounting Allocation for Access Networks	

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).
Either enter 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	106963		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim 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.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)	
thisapplication	Continuation of	16740625	2020-01-13	
Prior Application Status	Patented			Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16740625	Continuation of	16132643	2018-09-17	10536983	2020-01-14
Prior Application Status	Patented				Remove
16132643	Continuation of	15287603	2016-10-06	10080250	2018-09-18
Prior Application Status	Patented				Remove
15287603	Continuation of	14578124	2014-12-19	9565707	2017-02-07
Prior Application Status	Patented				Remove
14578124	Division of	13248028	2011-09-28	8924469	2014-12-30

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP037D1C1C1C1C1
	Application Number	
Title of Invention	Enterprise Access Control and Accounting Allocation for Access Networks	

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
13248028	Claims benefit of provisional	61387243	2010-09-28
Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13248028	Continuation in part of	12380778	2009-03-02	8321526	2012-11-27

Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13248028	Continuation in part of	12380780	2009-03-02	8839388	2014-09-16

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12380778	Claims benefit of provisional	61206354	2009-01-28
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Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12380778	Claims benefit of provisional	61206944	2009-02-04
Prior Application Status	Expired		Remove
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12380778	Claims benefit of provisional	61207393	2009-02-10
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12380778	Claims benefit of provisional	61207739	2009-02-13
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Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12380780	Claims benefit of provisional	61206354	2009-01-28
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12380780	Claims benefit of provisional	61206944	2009-02-04

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP037D1C1C1C1C1
	Application Number	
Title of Invention	Enterprise Access Control and Accounting Allocation for Access Networks	

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12380780	Claims benefit of provisional	61207393	2009-02-10
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12380780	Claims benefit of provisional	61207739	2009-02-13
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 priority to a foreign application. 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. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.			Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP037D1C1C1C1C1
	Application Number	
Title of Invention	Enterprise Access Control and Accounting Allocation for Access Networks	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP037D1C1C1C1C1
	Application Number	
Title of Invention	Enterprise Access Control and Accounting Allocation for Access Networks	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Headwater Research LLC		
Mailing Address Information For Applicant:			
Address 1	110 N. College Avenue, Suite 1116		
Address 2			
City	Tyler	**State/Province**	TX
Country	US	Postal Code	75702
Phone Number	903-201-6212	Fax Number	
Email Address	patent@headwaterllc.com		

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP037D1C1C1C1C1
	Application Number	
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Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	Headwater Research LLC

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	110 N. College Avenue, Suite 1116		
Address 2			
City	Tyler	**State/Province**	TX
Country i	US	Postal Code	75702
Phone Number	903-201-6212	Fax Number	
Email Address	patent@headwaterllc.com		

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/James E. Harris/			Date (YYYY-MM-DD)	2022-01-03
First Name	James E.	Last Name	Harris	Registration Number	40013

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RALEP037D1C1C1C1C1
	Application Number	
Title of Invention	Enterprise Access Control and Accounting Allocation for Access Networks	

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 CooperationTreaty.

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.

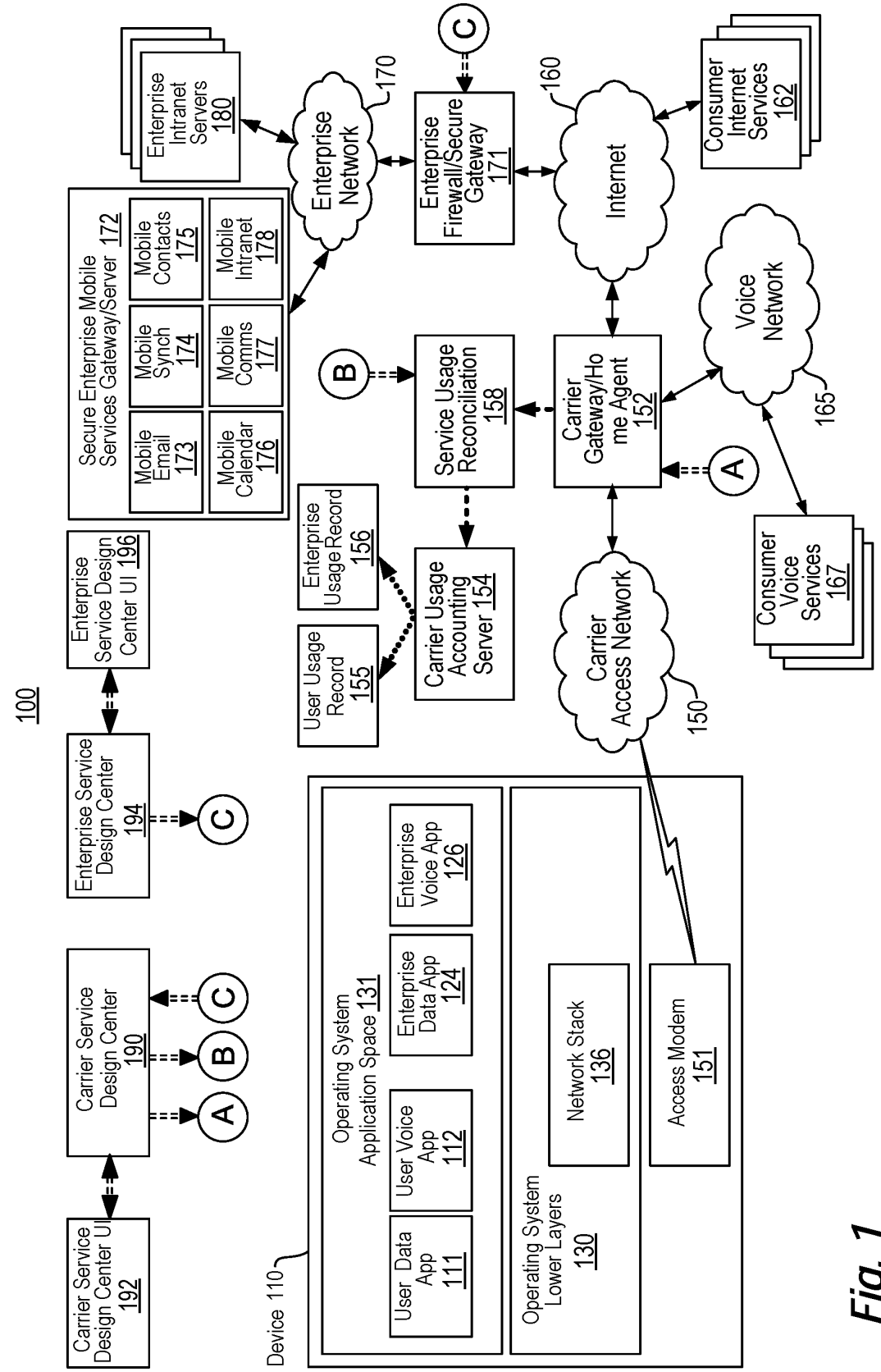

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Carrier Service Design Center 190
Enterprise Service Design Center 194
Enterprise Service Design Center UI 196
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User Data App 111
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Mobile Synch 174
Mobile Contacts 175
Mobile Calendar 176
Mobile Comms 177
Mobile Intranet 178
Enterprise Intranet Servers 180
Consumer Internet Services 162
Voice Network 165
Consumer Voice Services 167

Fig. 1

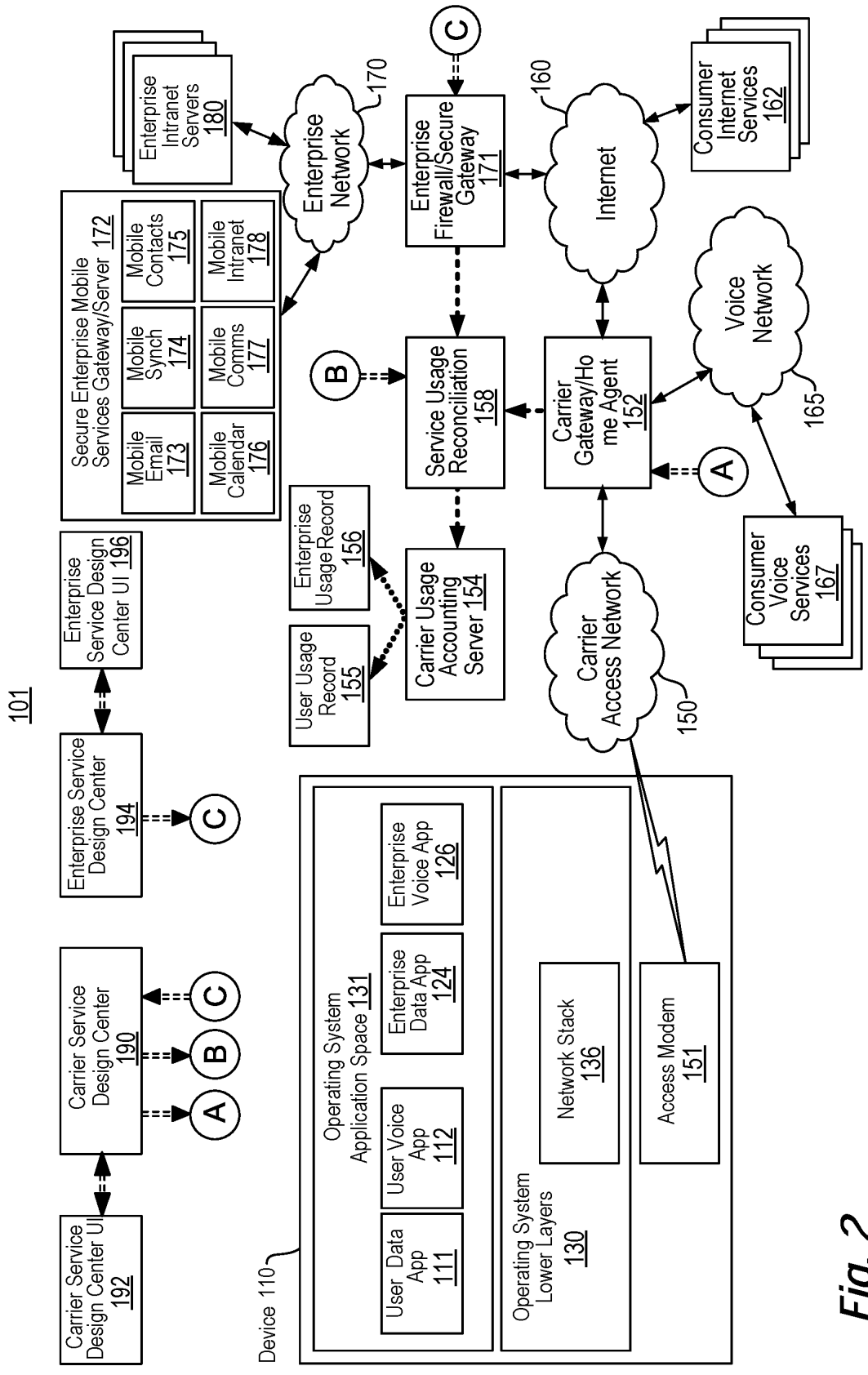

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Enterprise Intranet Servers 180
Enterprise Network 170
Enterprise Firewall/Secure Gateway 171
Internet 160
Consumer Internet Services 162
Voice Network 165
Consumer Voice Services 167

Fig. 2

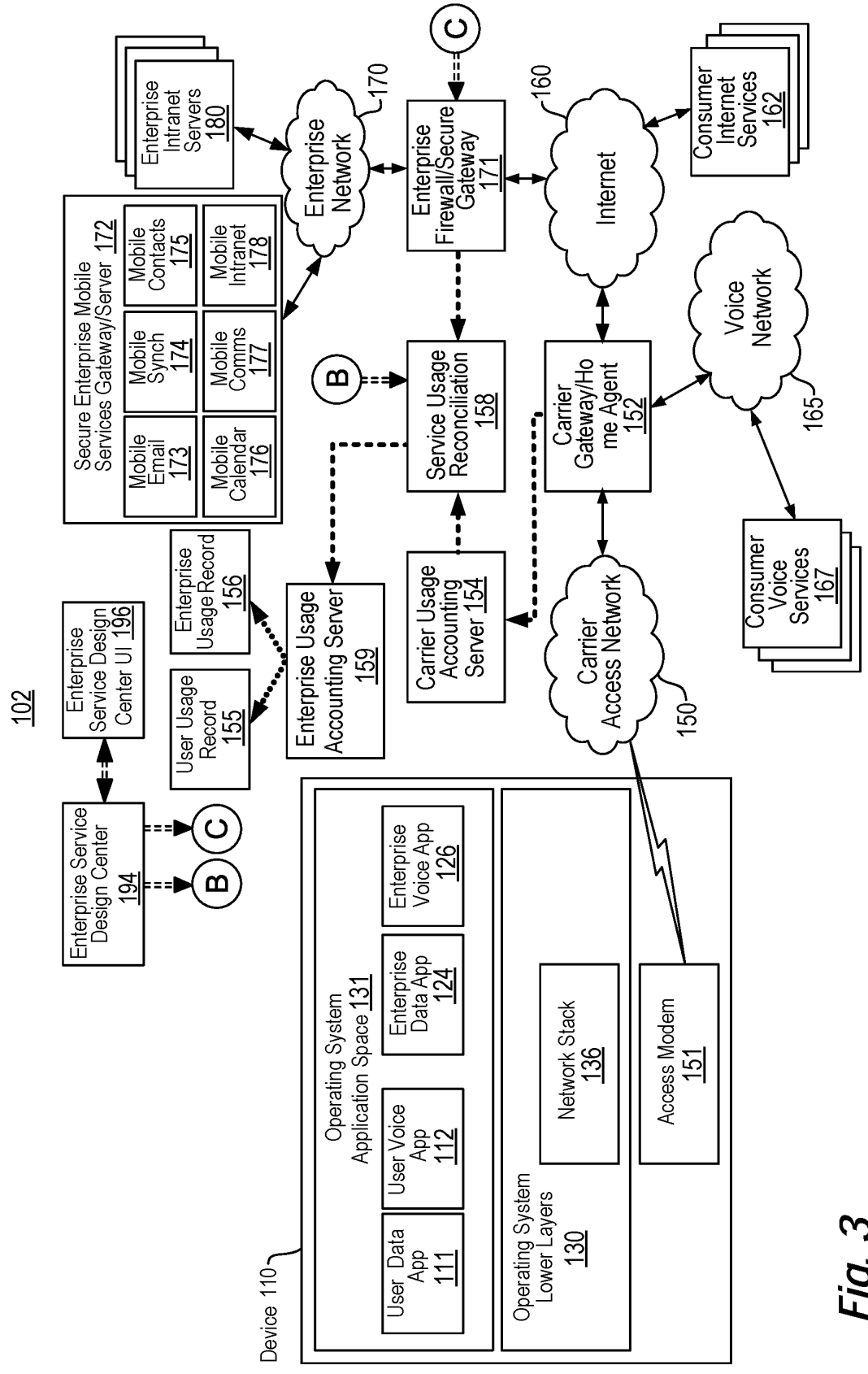

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Enterprise Service Design Center UI 196
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Operating System Application Space 131
User Data App 111
User Voice App 112
Enterprise Data App 124
Enterprise Voice App 126
Operating System Lower Layers 130
Network Stack 136
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Fig. 3

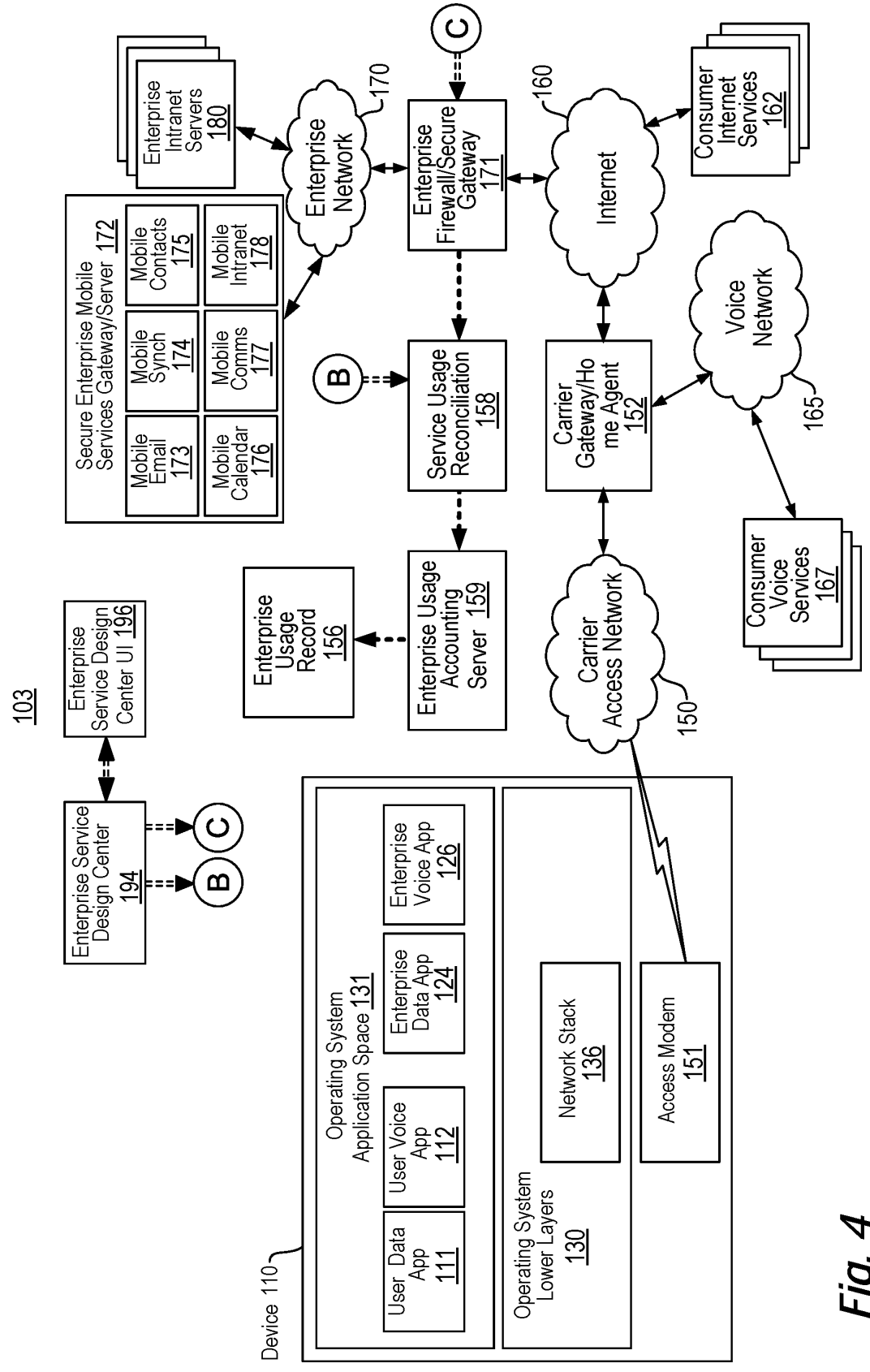

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Device 110
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User Data App 111
User Voice App 112
Enterprise Data App 124
Enterprise Voice App 126
Operating System Lower Layers 130
Network Stack 136
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Fig. 4

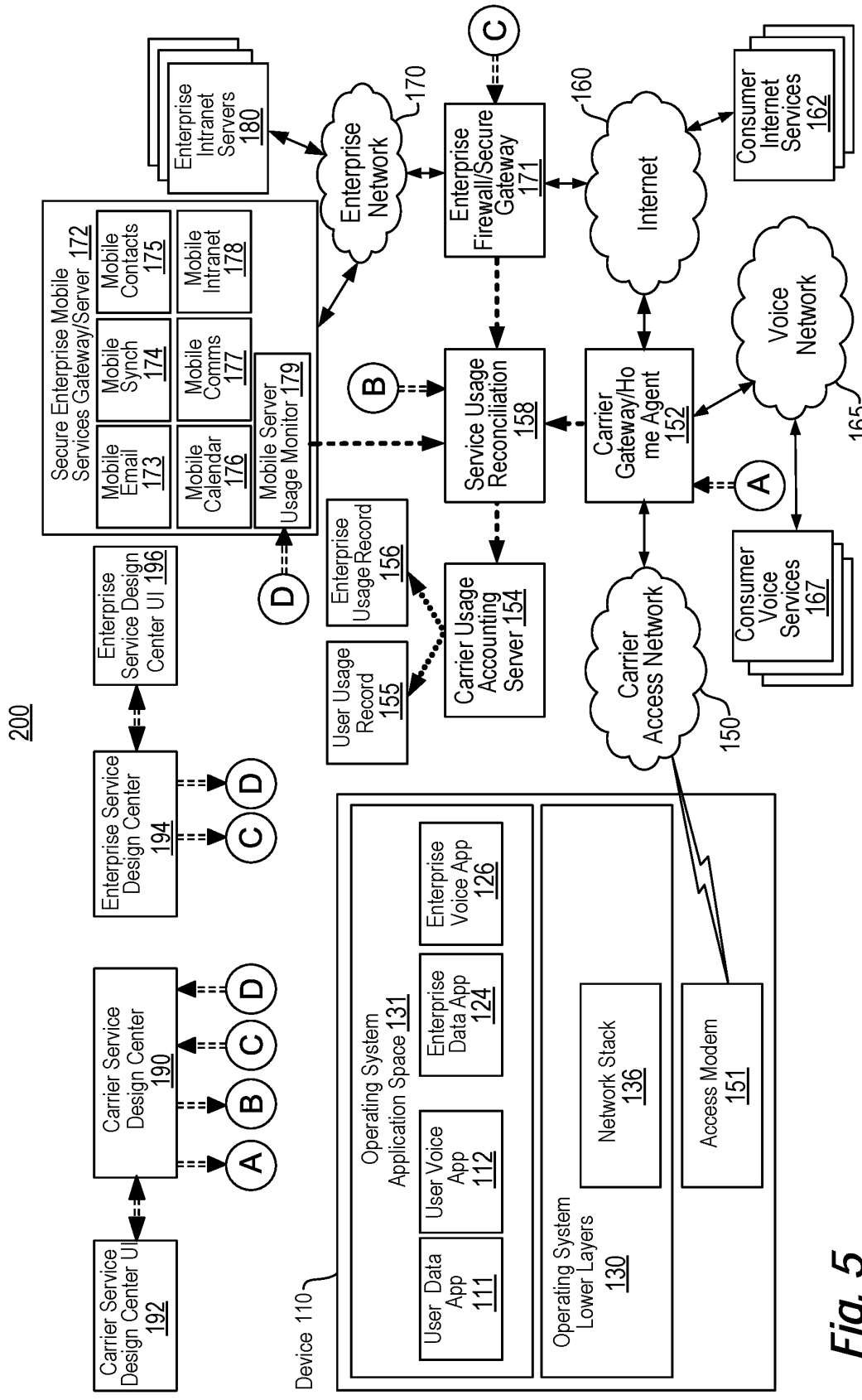

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Enterprise Service Design Center UI 196
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Carrier Usage Accounting Server 154
Service Usage Reconciliation 158
Enterprise Firewall/Secure Gateway 171
Carrier Gateway/Home Agent 152
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Consumer Internet Services 162
Consumer Voice Services 167

Fig. 5

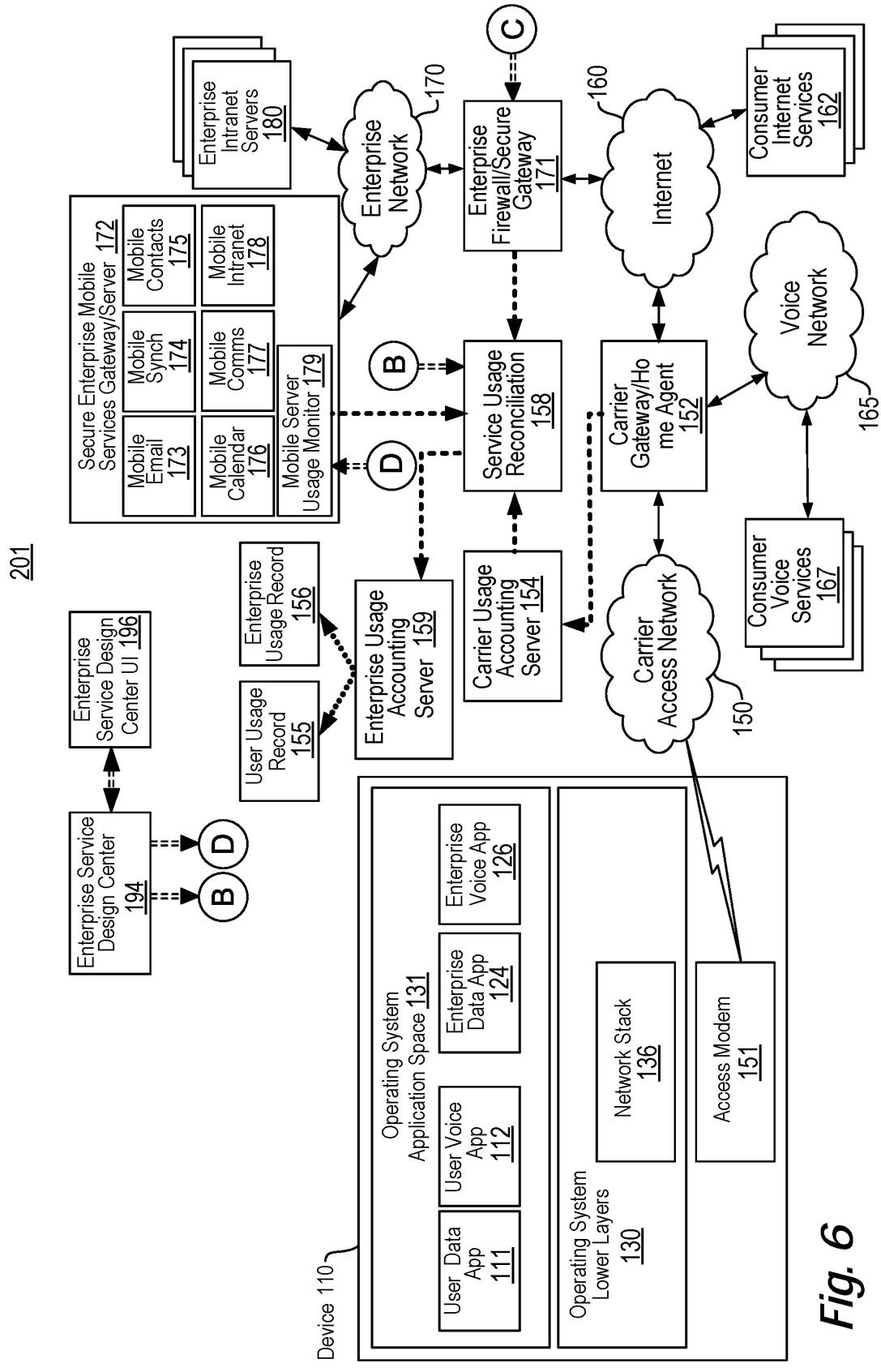

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Carrier Gateway/Home Agent 152
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Consumer Internet Services 162
Voice Network 165
Consumer Voice Services 167

Fig. 6

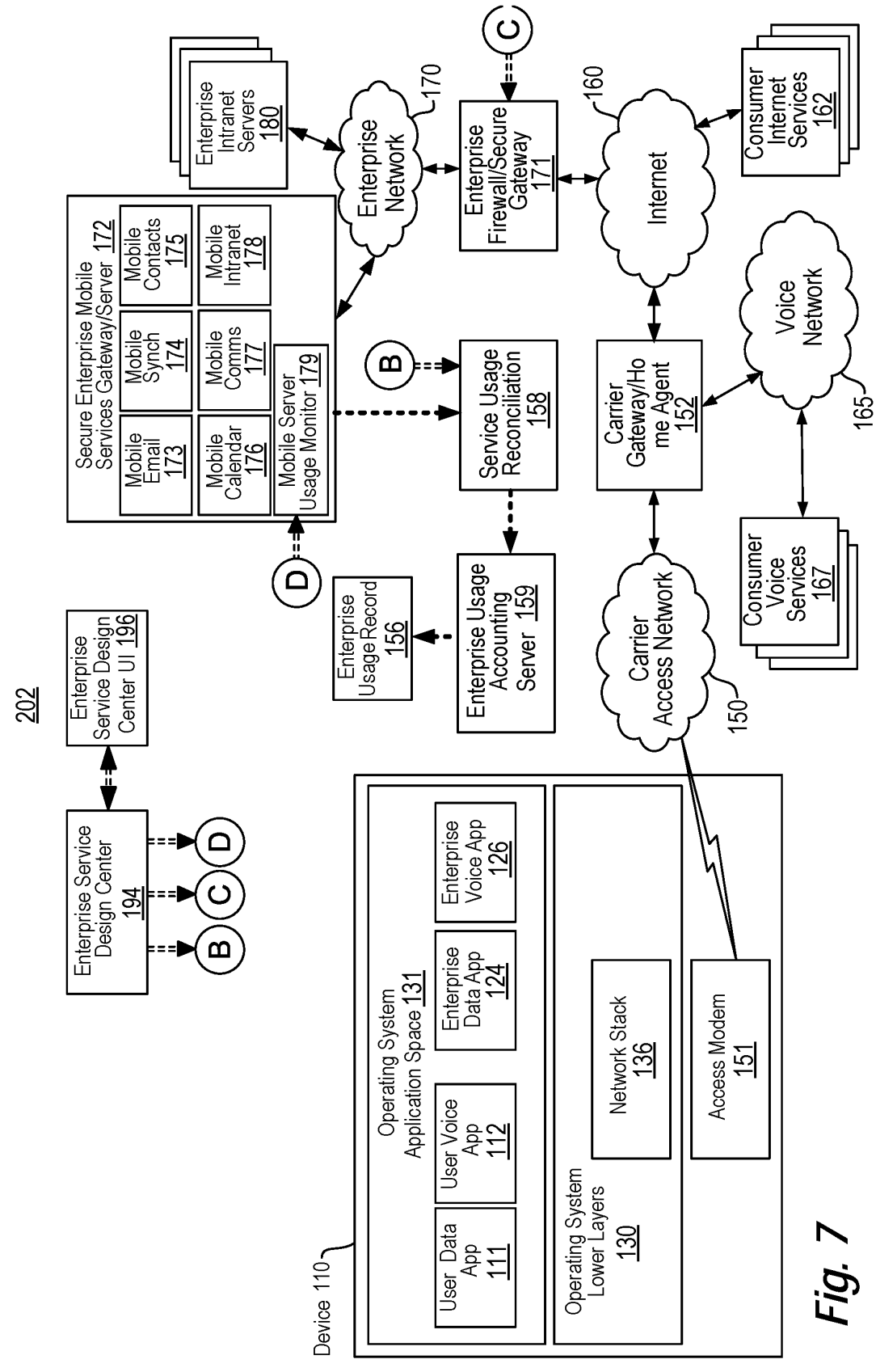

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Mobile Calendar 176
Mobile Comms 177
Mobile Intranet 178
Mobile Server Usage Monitor 179
Service Usage Reconciliation 158
Enterprise Usage Record 156
Enterprise Usage Accounting Server 159

Fig. 7

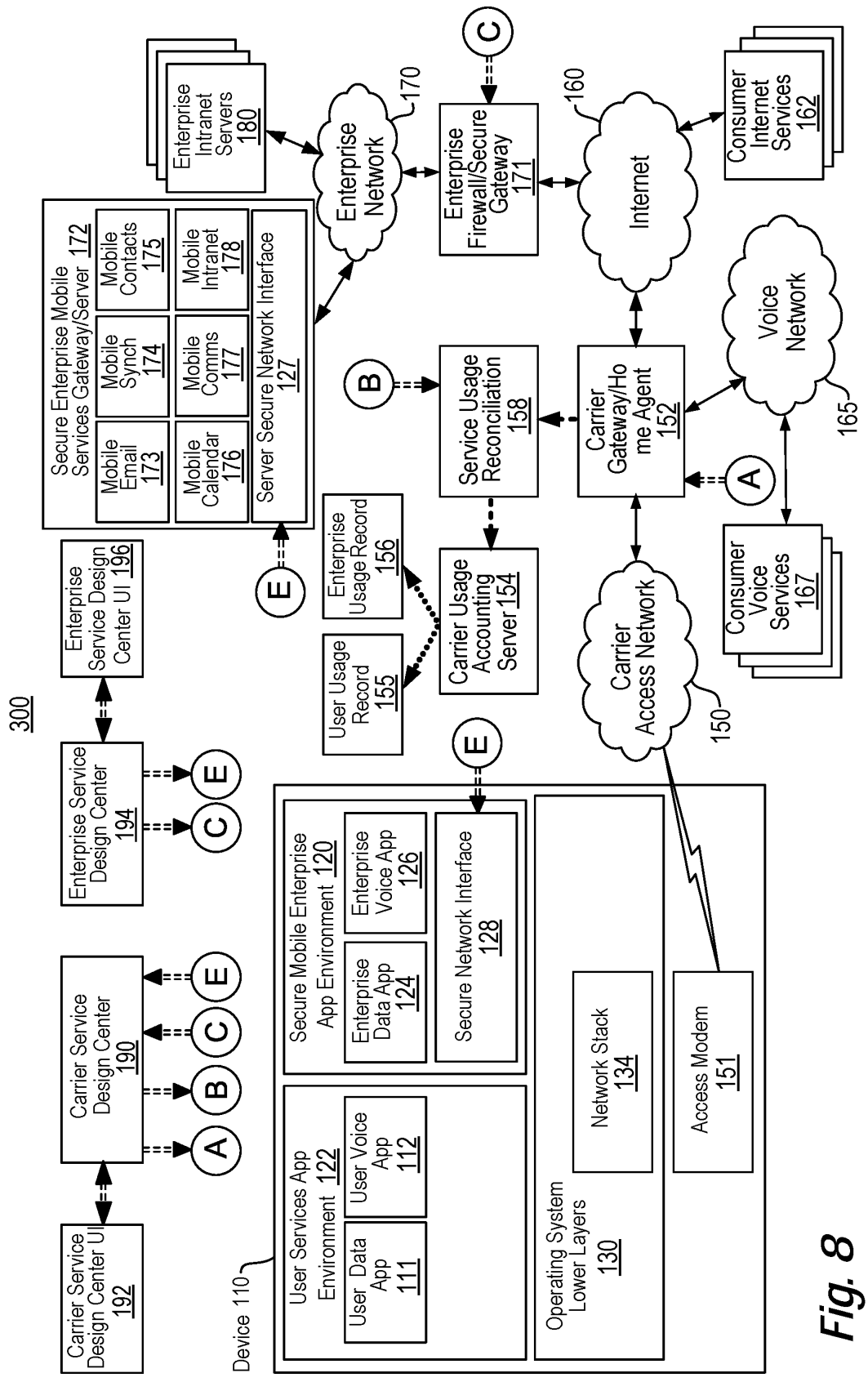

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Enterprise Usage Record 156
User Usage Record 155
Service Usage Reconciliation 158
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Carrier Gateway/Home Agent 152
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Consumer Voice Services 167

Fig. 8

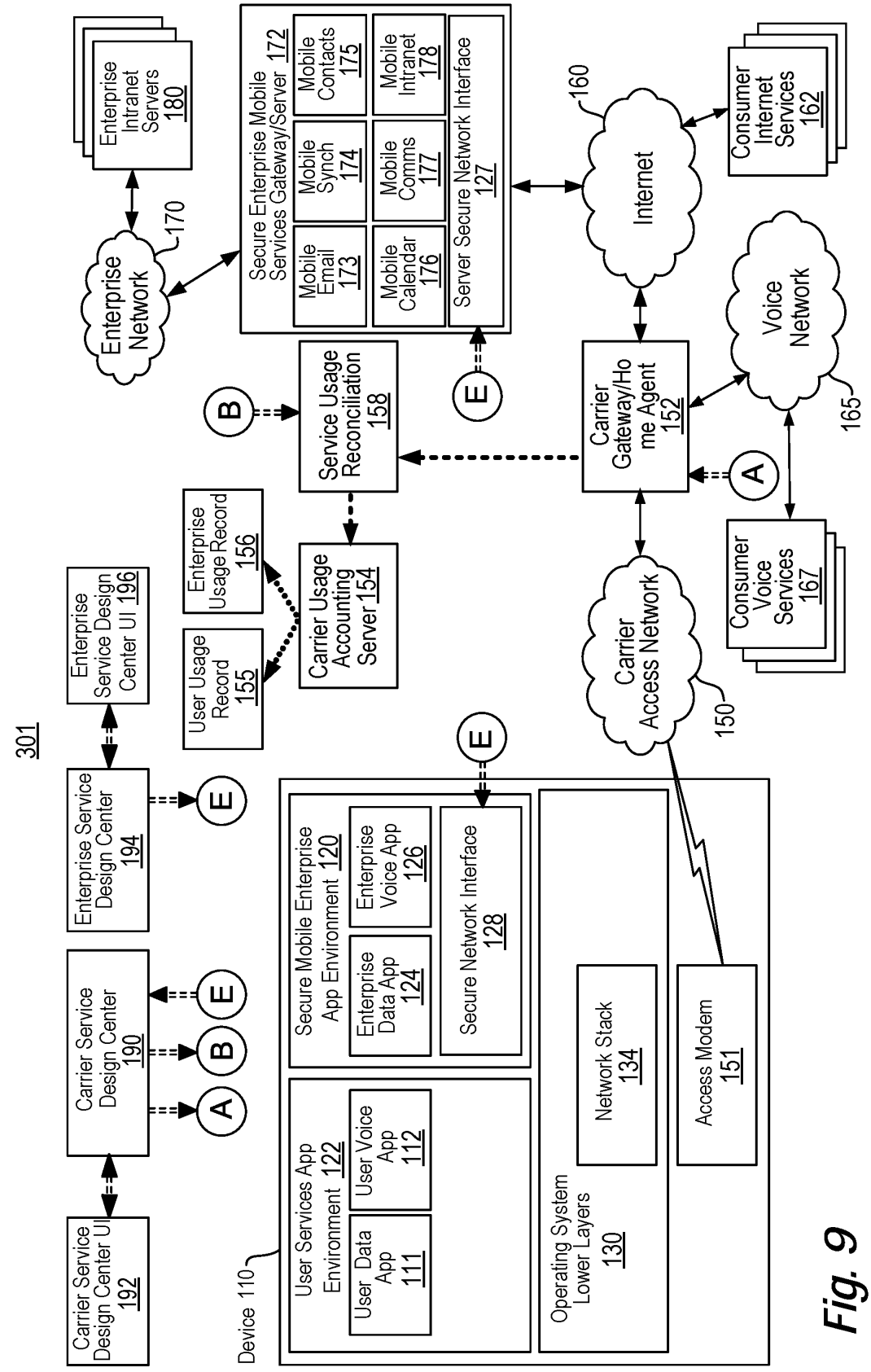

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Mobile Comms 177
Mobile Intranet 178
Server Secure Network Interface 127
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Carrier Access Network 150
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Fig. 9

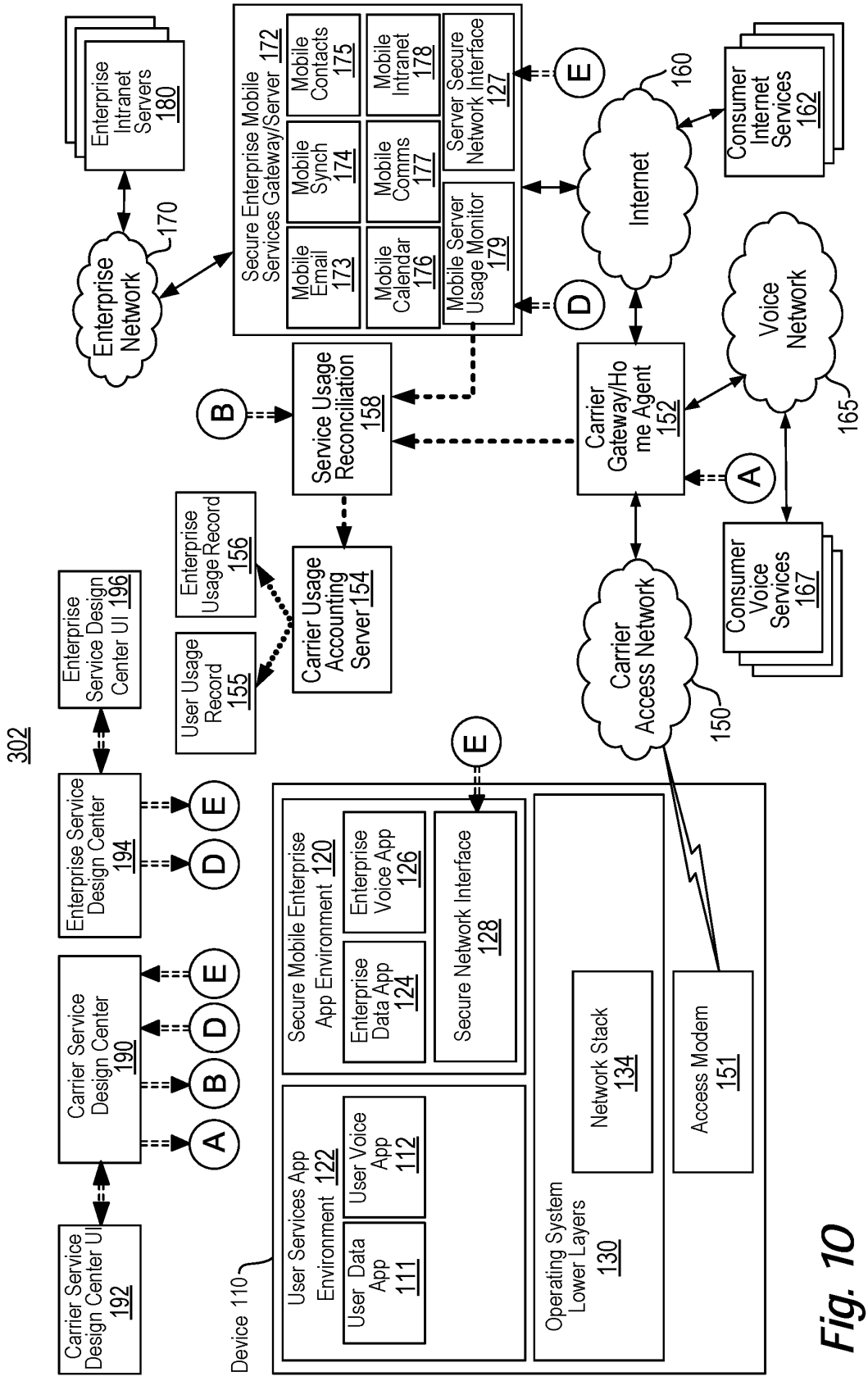

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Mobile Server Usage Monitor 179
Server Secure Network Interface 127
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Fig. 10

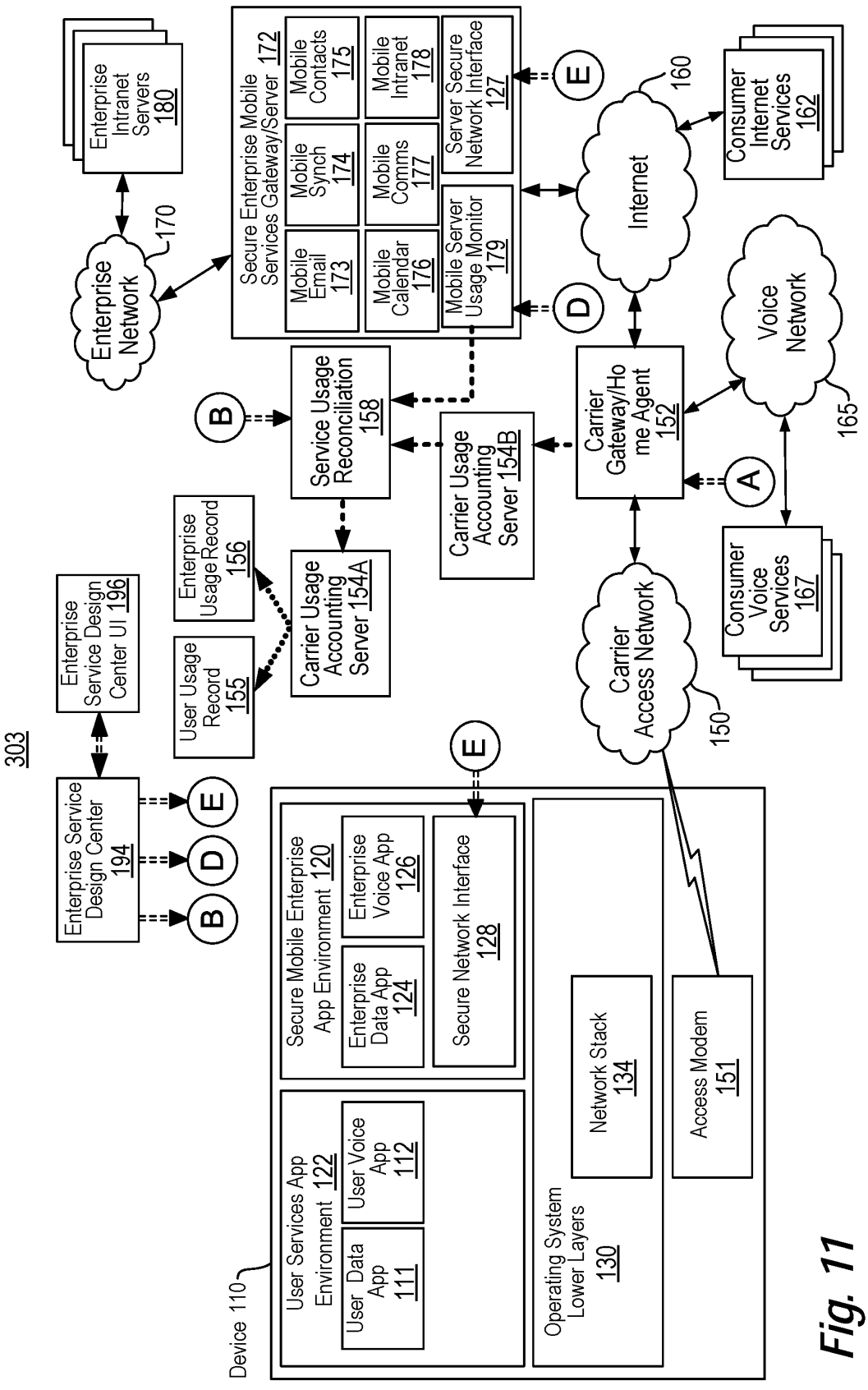

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Carrier Usage Accounting Server 154A
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Fig. 11

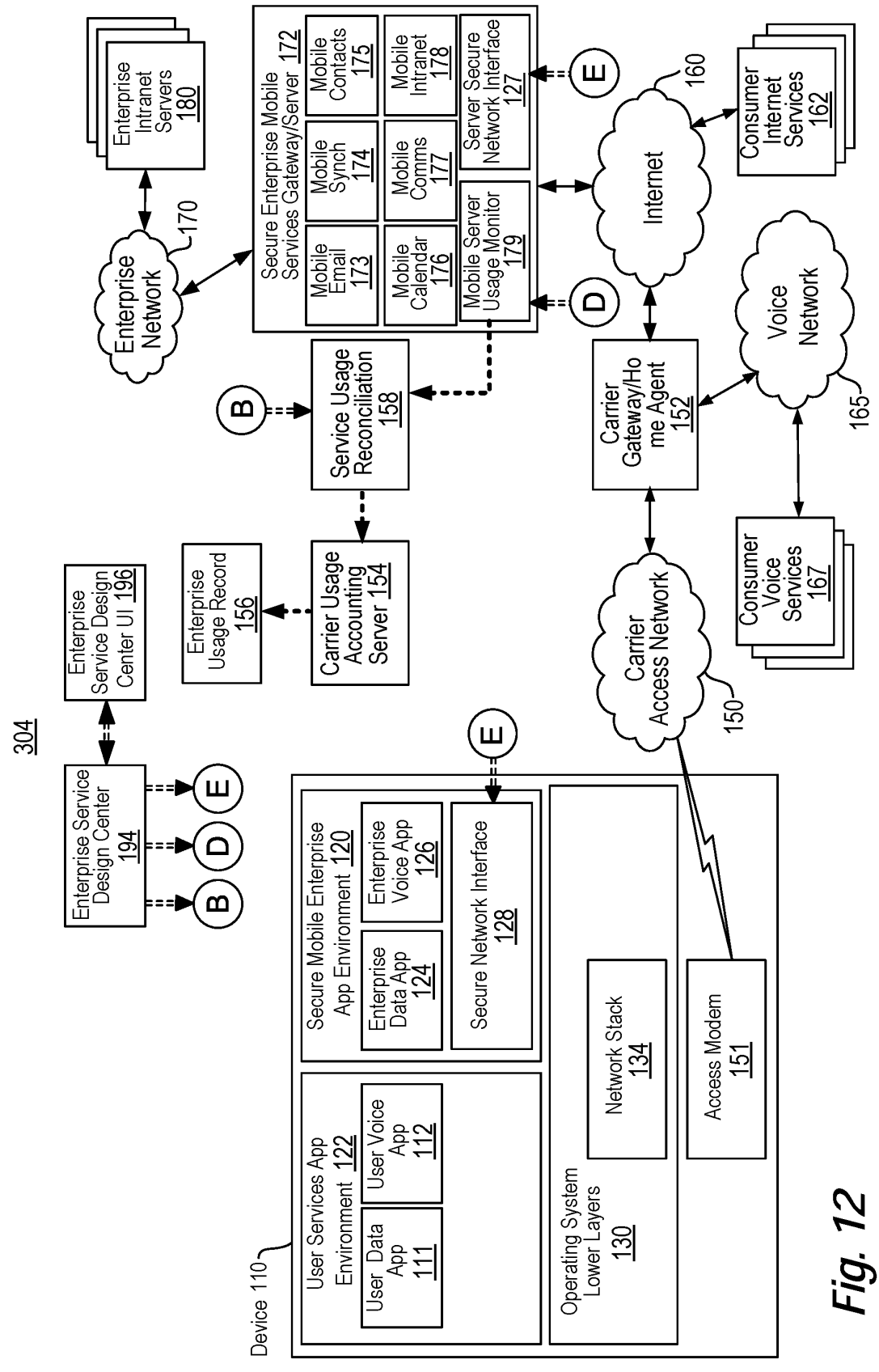

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Enterprise Service Design Center UI 196
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Mobile Intranet 178
Mobile Server Usage Monitor 179
Server Secure Network Interface 127
Carrier Gateway/Home Agent 152
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Fig. 12

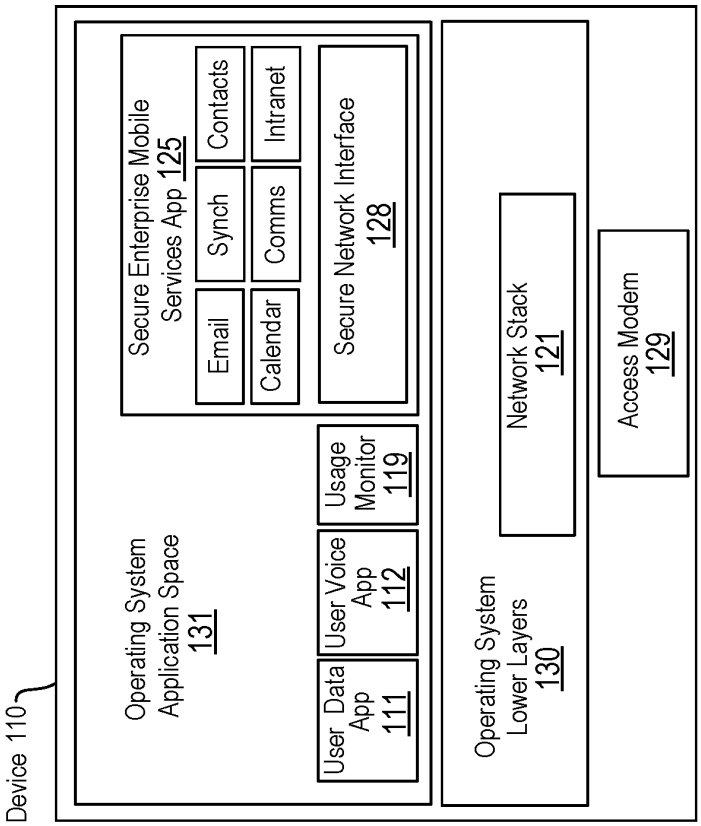

Device 110
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Intranet
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User Voice App 112
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Operating System Lower Layers 130
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Fig. 13

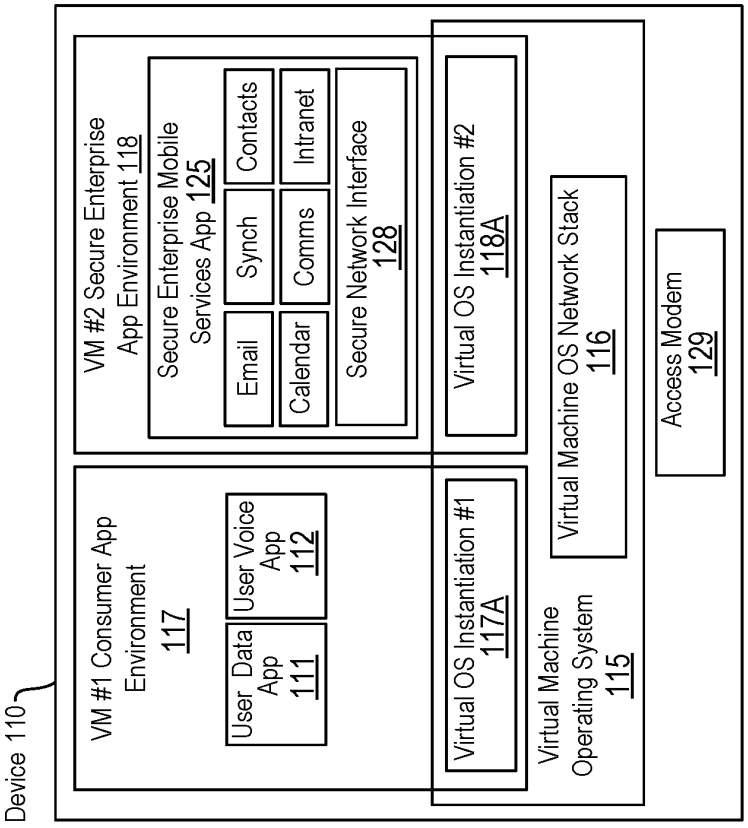

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User Voice App 112
VM #2 Secure Enterprise App Environment 118
Secure Enterprise Mobile Services App 125
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Secure Network Interface 128
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Virtual OS Instantiation #2 118A
Virtual Machine Operating System 115
Virtual Machine OS Network Stack 116
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Fig. 14

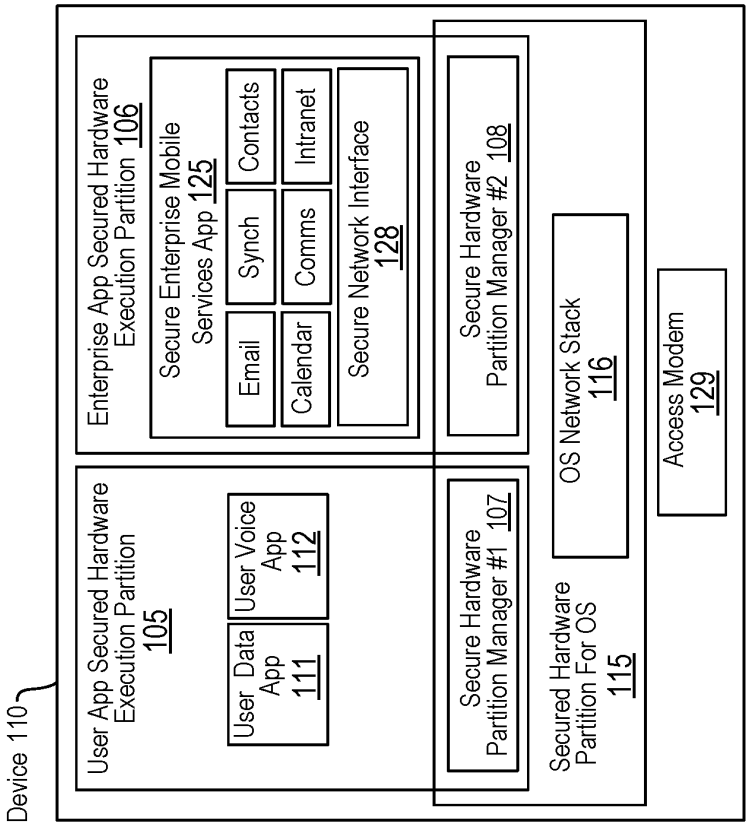

Device 110
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User Data App 111
User Voice App 112
Enterprise App Secured Hardware Execution Partition 106
Secure Enterprise Mobile Services App 125
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Secure Hardware Partition Manager #1 107
Secure Hardware Partition Manager #2 108
Secured Hardware Partition For OS 115
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Fig. 15

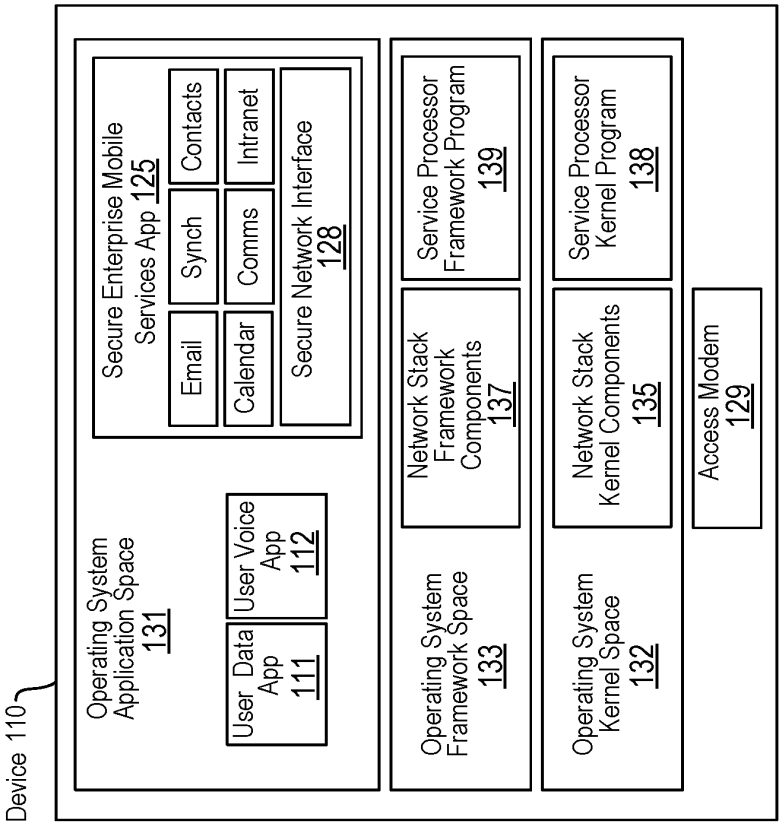

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Operating System Framework Space 133
Network Stack Framework Components 137
Service Processor Framework Program 139
Operating System Kernel Space 132
Network Stack Kernel Components 135
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Access Modem 129

Fig. 16

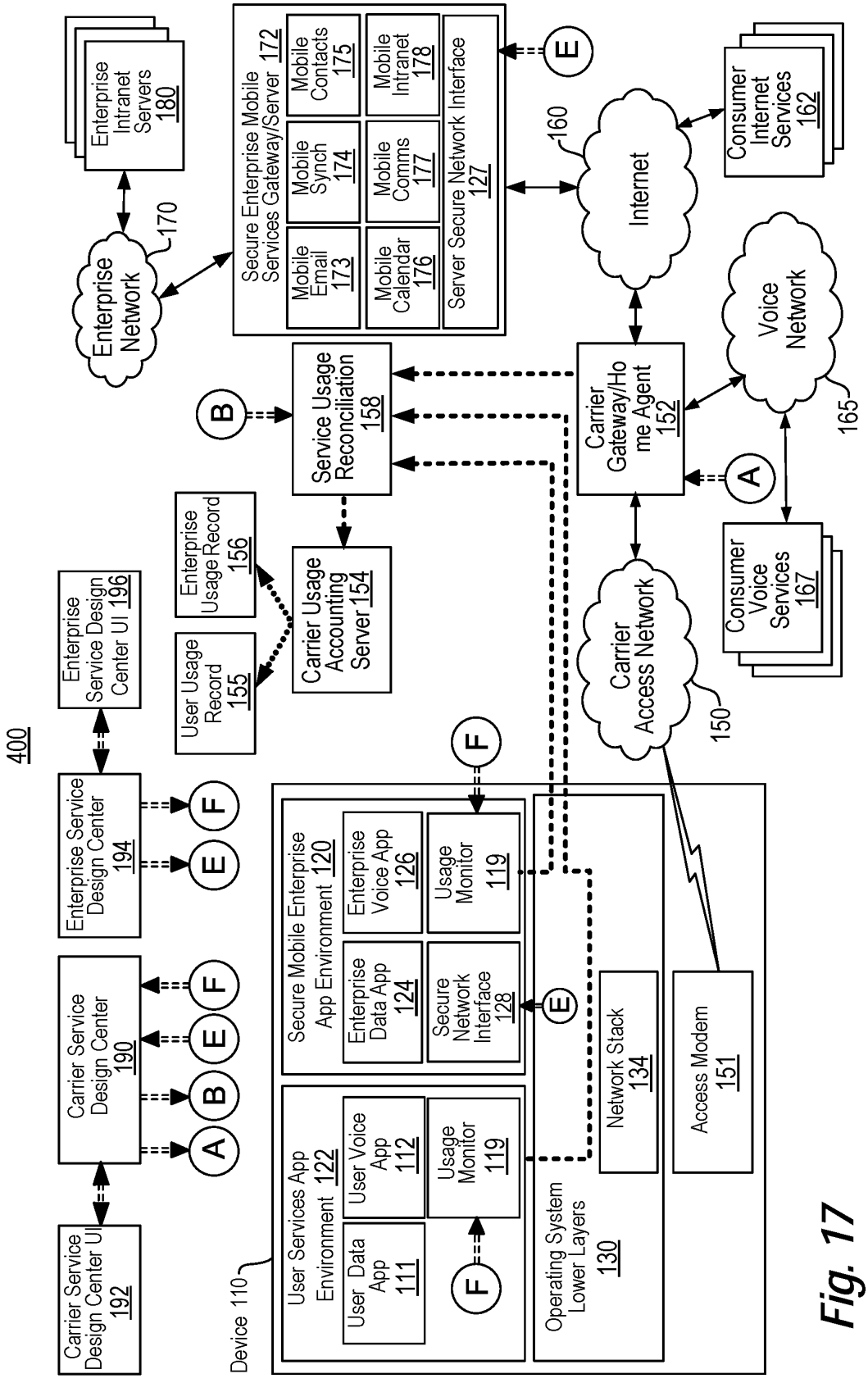

400
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Mobile Intranet 178
Server Secure Network Interface 127
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Internet 160
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Consumer Voice Services 167

Fig. 17

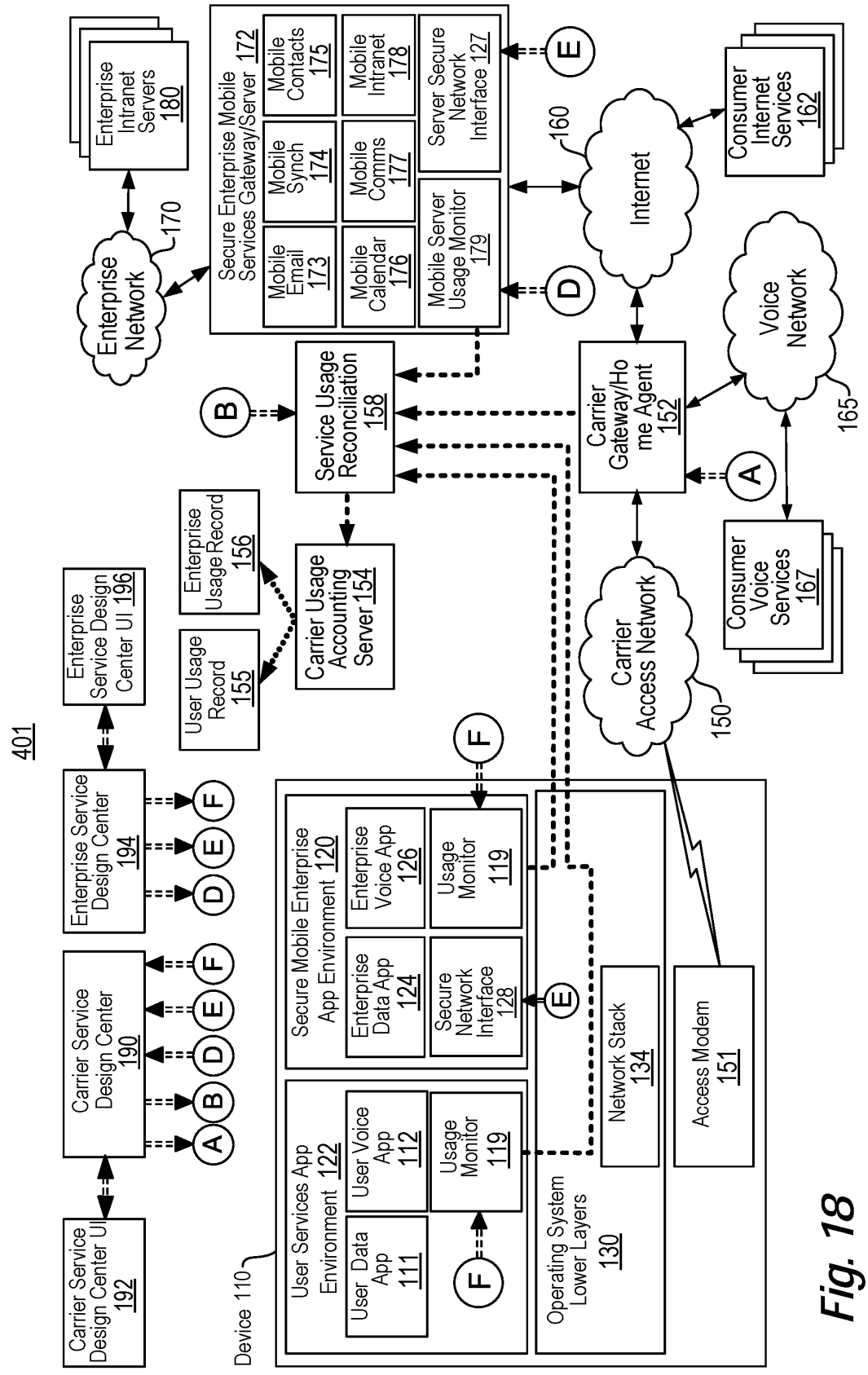

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Usage Monitor 119
Secure Mobile Enterprise App Environment 120
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Enterprise Voice App 126
Secure Network Interface 128
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Mobile Comms 177
Mobile Intranet 178
Mobile Server Usage Monitor 179
Server Secure Network Interface 127
Enterprise Intranet Servers 180
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Consumer Internet Services 162
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Fig. 18

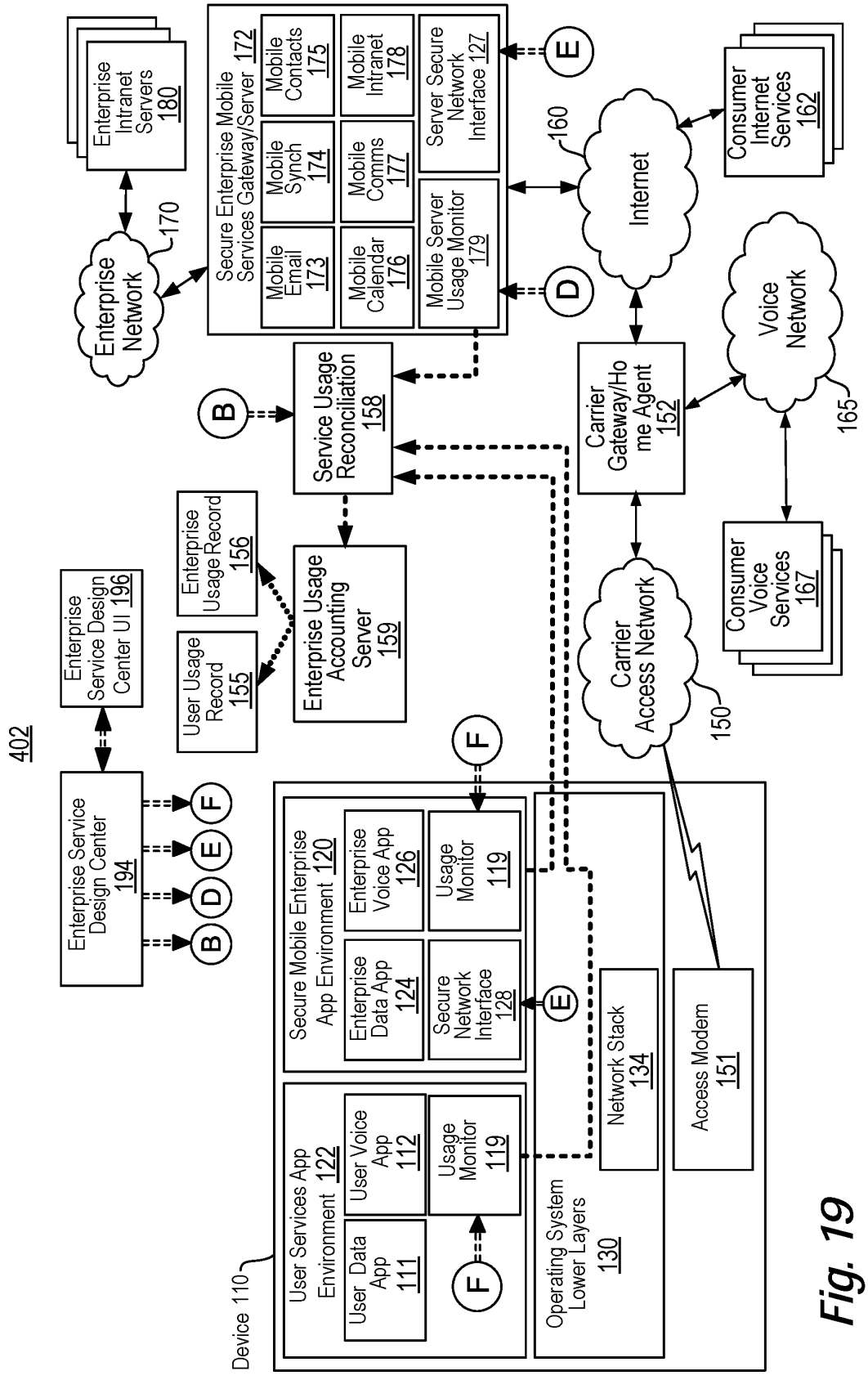

402
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Service Usage Reconciliation 158
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Secure Enterprise Mobile Services Gateway/Server 172
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Usage Monitor 119
Operating System Lower Layers 130
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Fig. 19

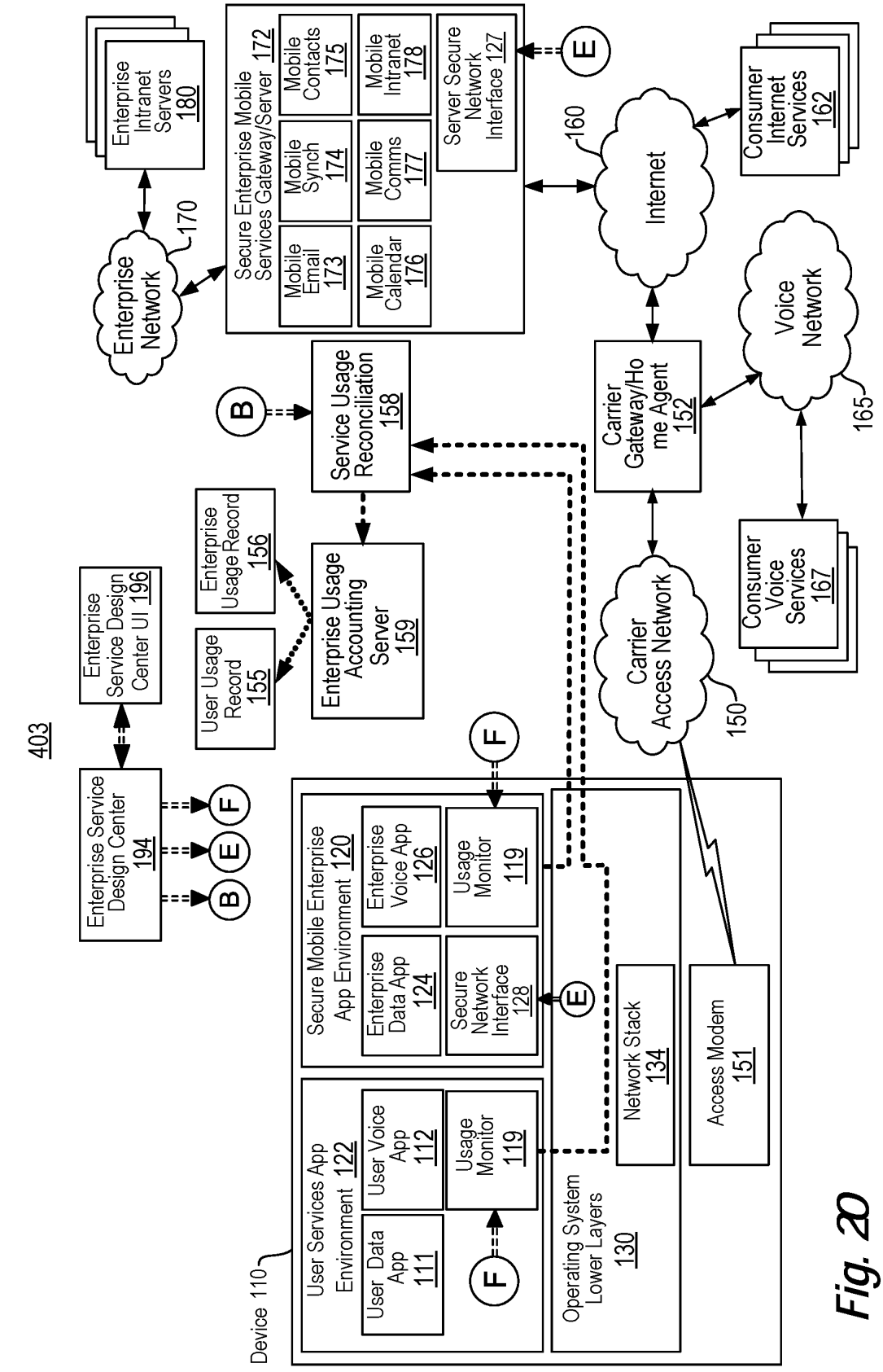

403
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User Data App 111
User Voice App 112
Usage Monitor 119
Secure Mobile Enterprise App Environment 120
Enterprise Data App 124
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Mobile Intranet 178
Server Secure Network Interface 127
Service Usage Reconciliation 158
Enterprise Usage Accounting Server 159
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User Usage Record 155
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Fig. 20

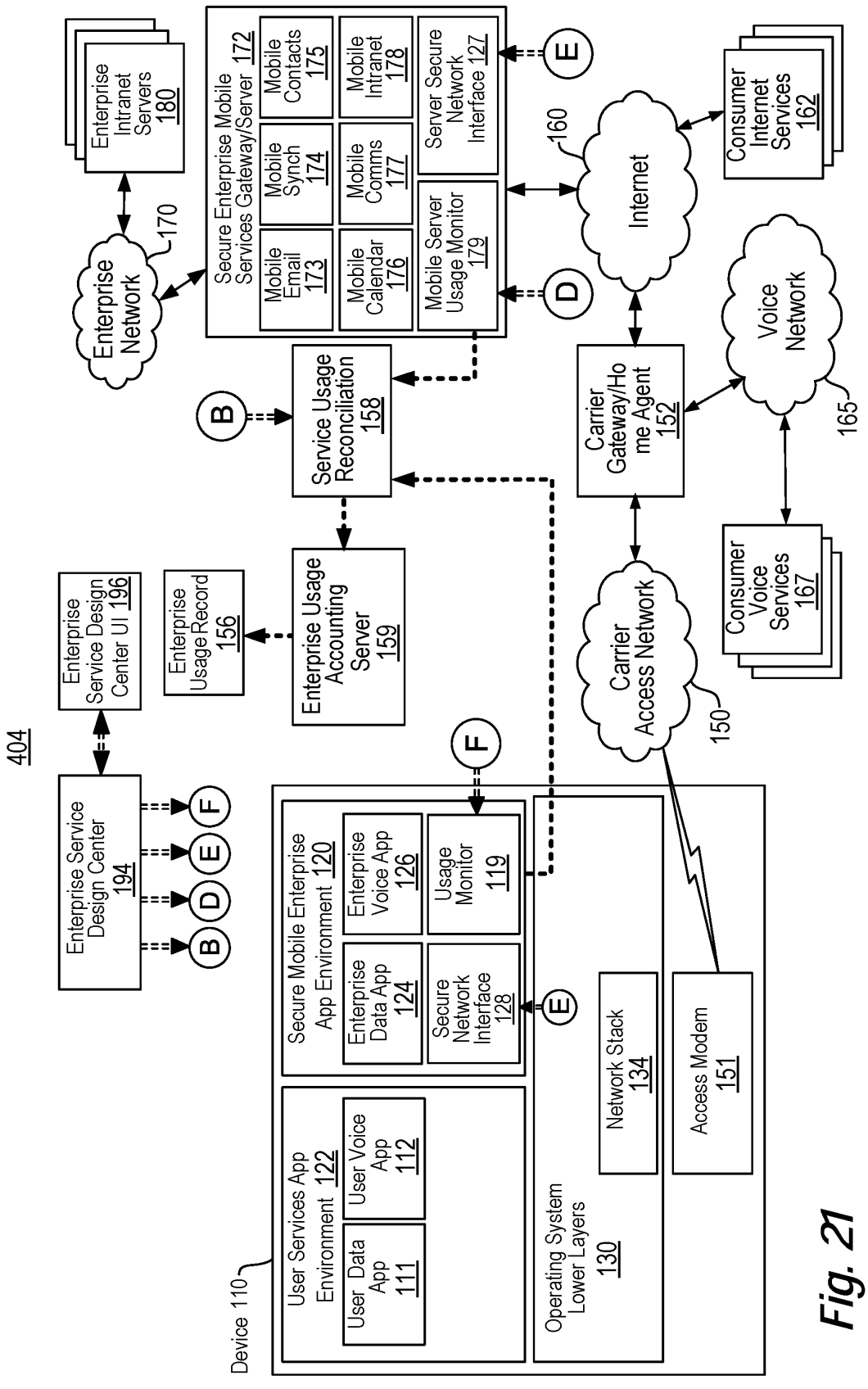

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Service Usage Reconciliation 158
Enterprise Network 170
Enterprise Intranet Servers 180
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Usage Monitor 119
Operating System Lower Layers 130
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Fig. 21

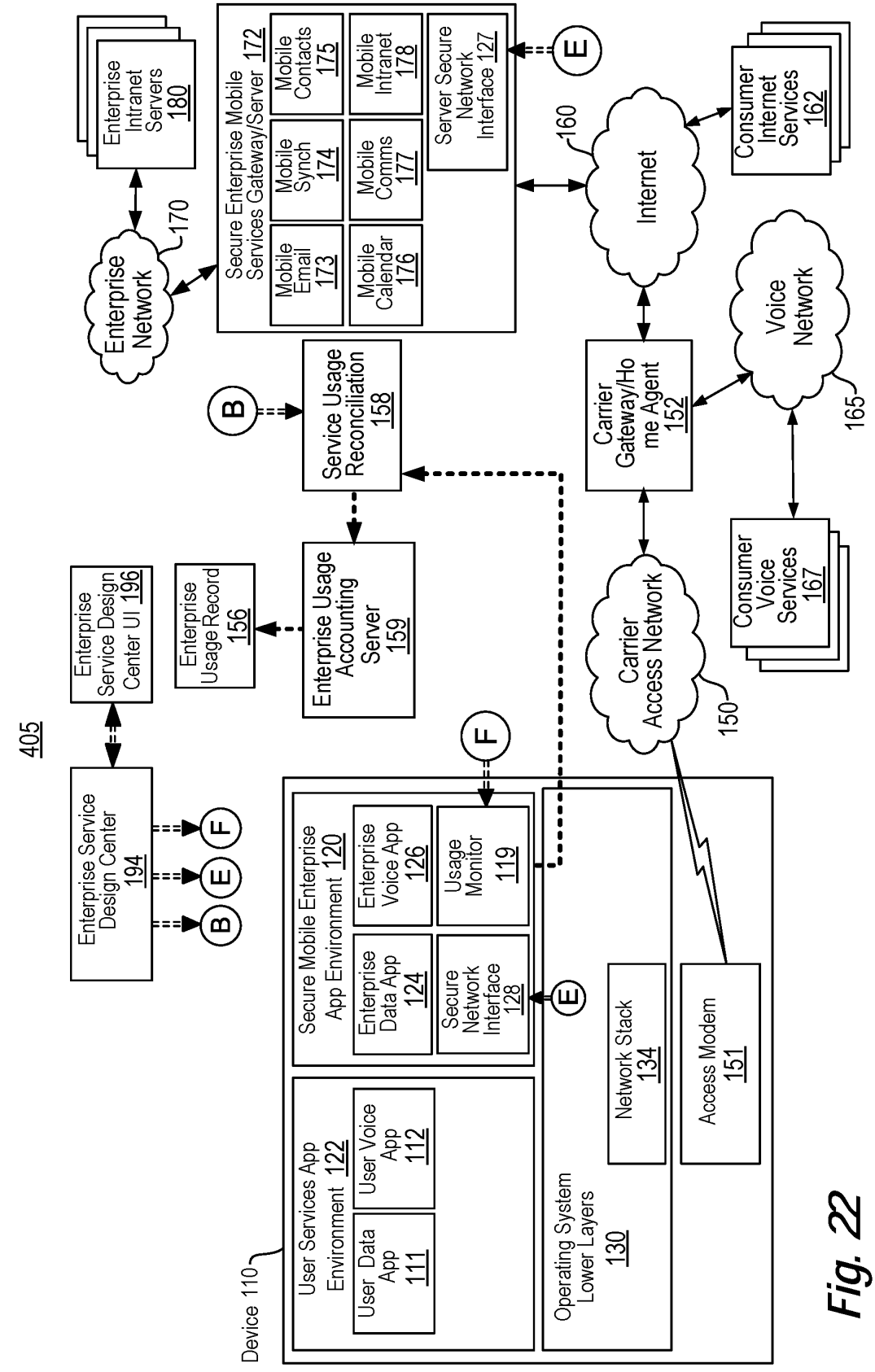

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Fig. 22

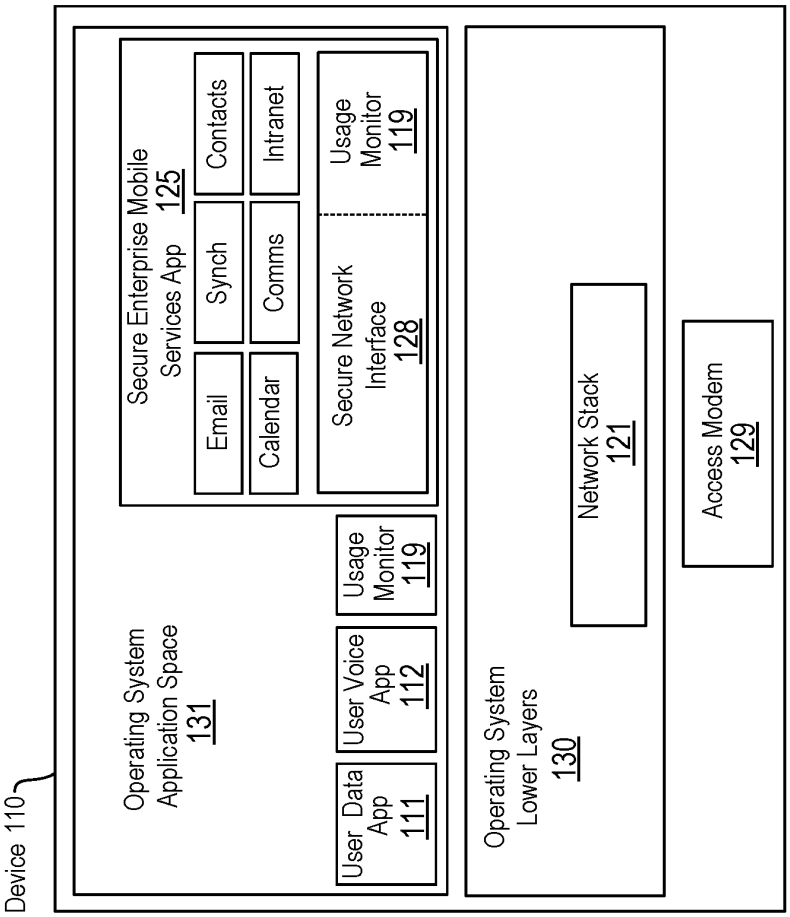

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Intranet
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Usage Monitor 119
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User Voice App 112
Usage Monitor 119
Operating System Lower Layers 130
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Access Modem 129

Fig. 23

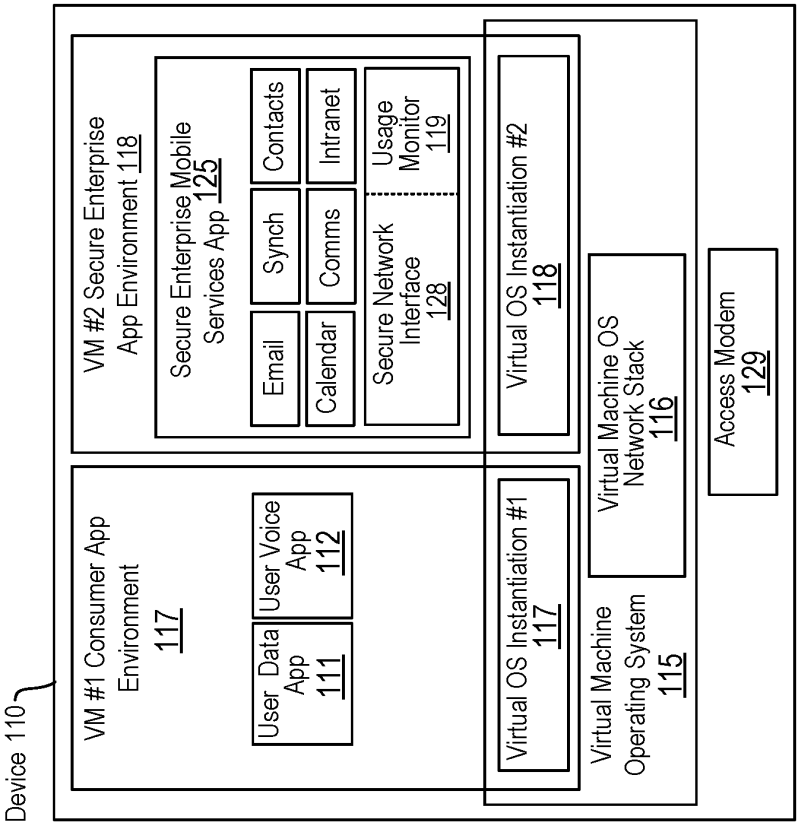

Device 110
VM #1 Consumer App Environment 117
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VM #2 Secure Enterprise App Environment 118
Secure Enterprise Mobile Services App 125
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Secure Network Interface 128
Usage Monitor 119
Virtual OS Instantiation #1 117
Virtual OS Instantiation #2 118
Virtual Machine Operating System 115
Virtual Machine OS Network Stack 116
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Fig. 24

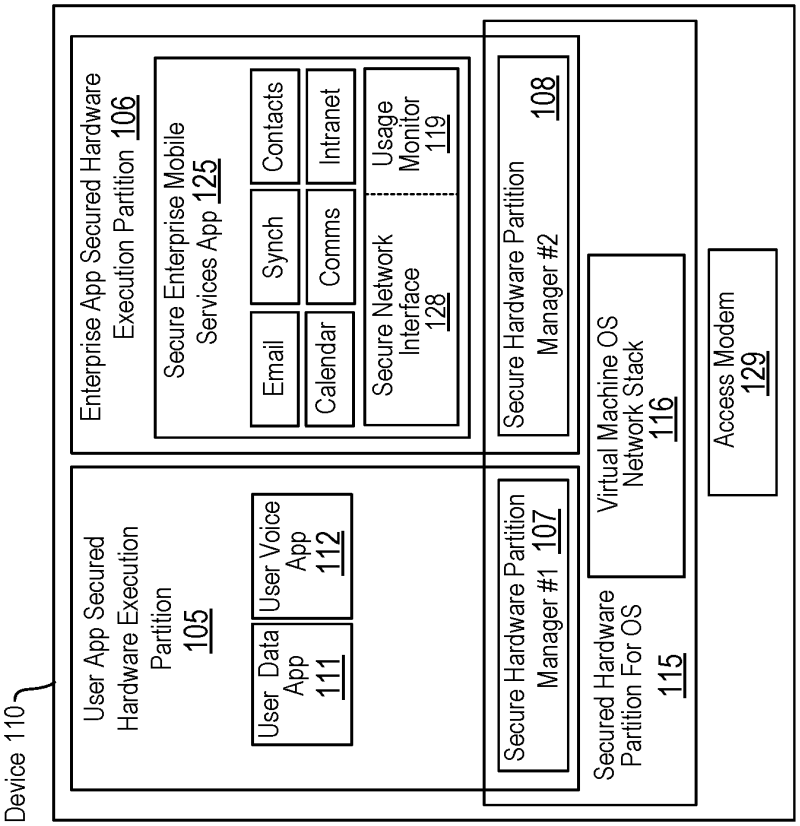

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Usage Monitor 119
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Secure Hardware Partition Manager #2 108
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Fig. 25

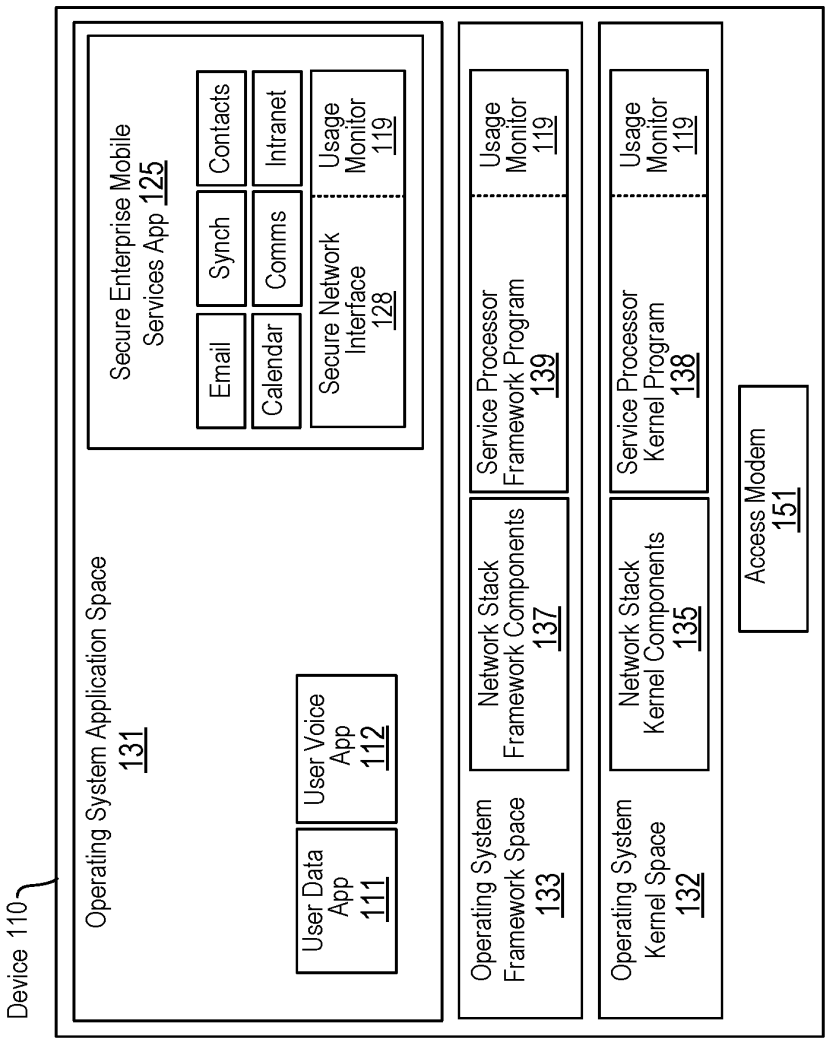

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Comms
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Intranet
Secure Network Interface 128
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User Voice App 112
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Service Processor Framework Program 139
Usage Monitor 119
Operating System Kernel Space 132
Network Stack Kernel Components 135
Service Processor Kernel Program 138
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Fig. 26

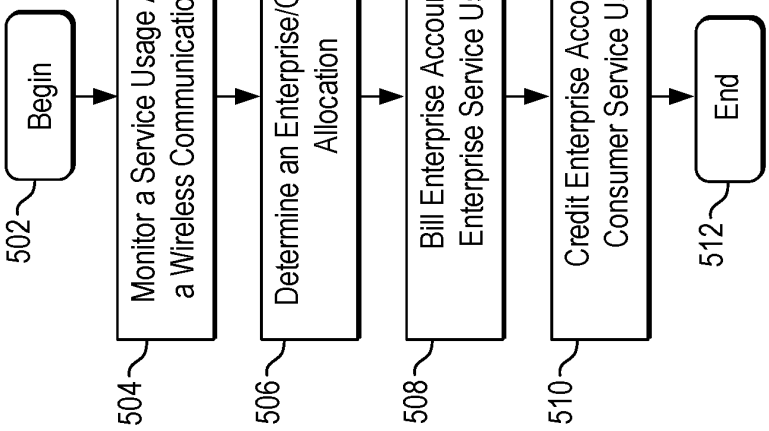

Begin
Monitor a Service Usage Activity of a Wireless Communication Device
Determine an Enterprise/Consumer Allocation
Bill Enterprise Account for Enterprise Service Usage
Credit Enterprise Account for Consumer Service Usage
End
502
504
506
508
510
512

Fig. 28

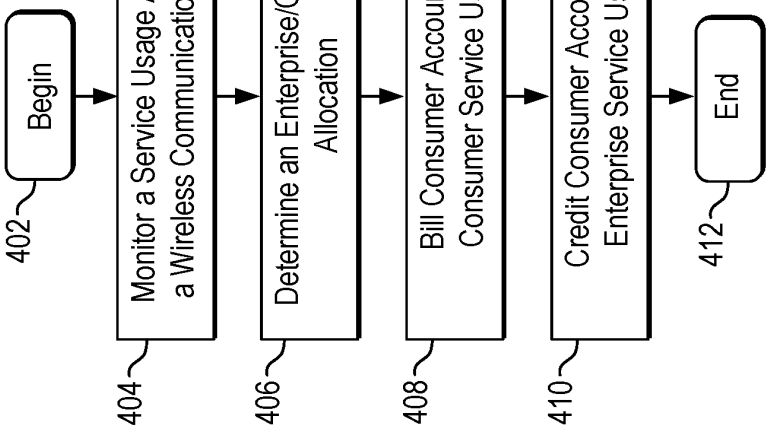

Begin
Monitor a Service Usage Activity of a Wireless Communication Device
Determine an Enterprise/Consumer Allocation
Bill Consumer Account for Consumer Service Usage
Credit Consumer Account for Enterprise Service Usage
End
402
404
406
408
410
412

Fig. 27

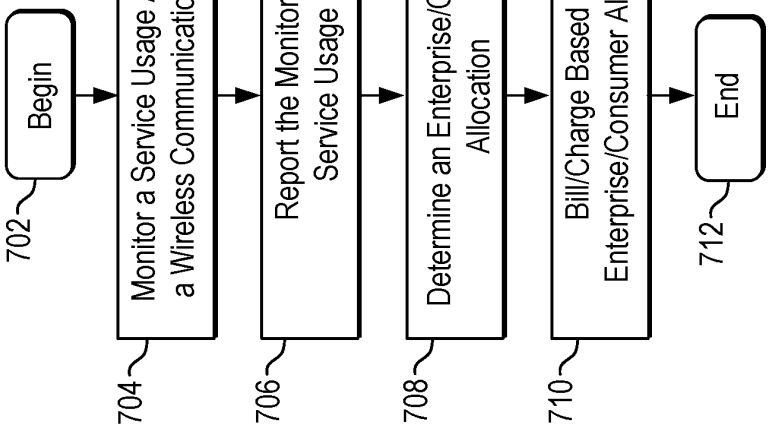

Begin
Monitor a Service Usage Activity of a Wireless Communication Device
Report the Monitored Service Usage
Determine an Enterprise/Consumer Allocation
Bill/Charge Based on Enterprise/Consumer Allocation
End
702
704
706
708
710
712

Fig. 30

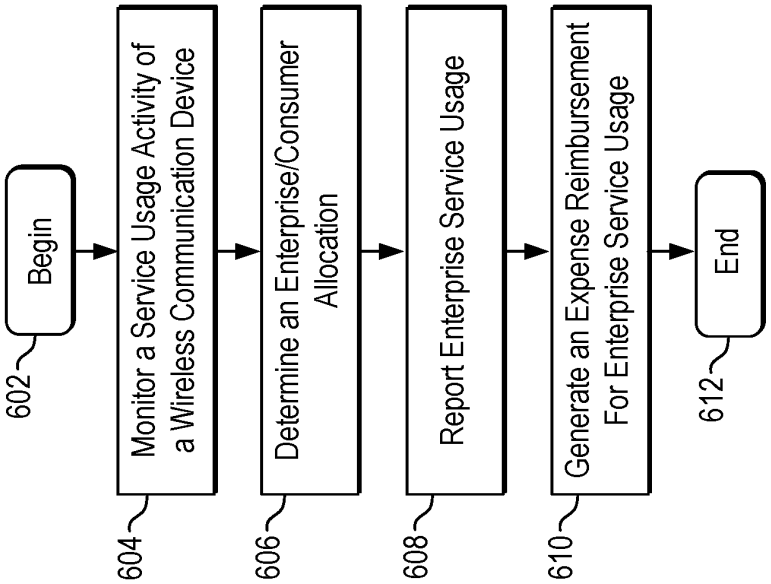

Begin
Monitor a Service Usage Activity of a Wireless Communication Device
Determine an Enterprise/Consumer Allocation
Report Enterprise Service Usage
Generate an Expense Reimbursement For Enterprise Service Usage
End
602
604
606
608
610
612

Fig. 29

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Enterprise Access Control and Accounting Allocation for Access Networks

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

■ United States application or PCT international application number 14/578,124 filed on December 19, 2014.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

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LEGAL NAME OF INVENTOR

Inventor: Gregory G. Raleigh Date (Optional): _____

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	Enterprise Access Control and Accounting Allocation for Access Networks

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 14/578,124 filed on December 19, 2014.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Alireza Raissinia Date (Optional): 1/10/2015

Signature:

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTOR

Inventor: Jeffrey Green Date (Optional) :

Signature:

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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EFS ID:	44655770
Application Number:	17567594
International Application Number:	
Confirmation Number:	1081
Title of Invention:	Enterprise Access Control and Accounting Allocation for Access Networks
First Named Inventor/Applicant Name:	GREGORY RALEIGH
Customer Number:	106963
Filer:	James E. Harris/Jennifer Smith
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Specification	P037D1C1C1C1C1_Spec.pdf	394210 2346be8a4ac9036693cdde8cc542b85f377ac57a	no	73

Warnings:

Information:					
2	Claims	CLAIMS.pdf	50749 8598cdba9642f1471eacb340b849a10714ec7669	no	1
Warnings:					
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3	Abstract	Abstract.pdf	46442 c53e18edd7bf160ca767acb0f6a29440198adf26	no	1
Warnings:					
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4	Application Data Sheet	ADS.pdf	1823907 8f7376fd94b26ff6ba9cfda1c0c68f7977b9f97f	no	10
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5	Drawings-only black and white line drawings	P037D1C1C1C1C1_Drawings.pdf	406870 0fed0017c774626e0f4313822c651a8399c75159	no	28
Warnings:					
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6	Oath or Declaration filed	P037D1C1C1C1C1_RaleighD.pdf	63734 cab652a179428fd64b7fc192127d649e1ea710e8	no	1
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7	Oath or Declaration filed	P037D1C1C1C1C1_RaissiniaD.pdf	65339 6e385d8cba239dcef982e842c18c69a767af3d29	no	1
Warnings:					
Information:					
8	Oath or Declaration filed	P037D1C1C1C1C1_GreenD.pdf	63831 a8fe22489aa23479146f18d3f5e803407b7129a1	no	1
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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.