PATENT ASSIGNMENT COVER SHEET

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Stylesheet Version v1.2

EPAS ID: PAT4170406

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	GRANT OF A SECURITY INTEREST -- PATENTS

CONVEYING PARTY DATA

Name	Execution Date
ASSIA SPE, LLC	12/01/2016

RECEIVING PARTY DATA

Name:	MGG CALIFORNIA LLC, AS COLLATERAL AGENT
Street Address:	888 SEVENTH AVENUE
City:	NEW YORK
State/Country:	NEW YORK
Postal Code:	10106

PROPERTY NUMBERS Total: 96

Property Type	Number
Application Number:	10817128
Application Number:	11945210
Application Number:	10808771
Application Number:	10919620
Application Number:	10922705
Application Number:	10981068
Application Number:	11069159
Application Number:	11122365
Application Number:	11267623
Application Number:	12853209
Application Number:	11284692
Application Number:	11336113
Application Number:	11344873
Application Number:	11345215
Application Number:	13194736
Application Number:	11363769
Application Number:	11367930
Application Number:	11342024
Application Number:	11342028
Application Number:	11341969

Property Type	Number
Application Number:	11342023
Application Number:	11342003
Application Number:	14630569
Application Number:	12089044
Application Number:	13214598
Application Number:	14685522
Application Number:	12227966
Application Number:	14605911
Application Number:	11995194
Application Number:	13084829
Application Number:	11995195
Application Number:	12940970
Application Number:	12375216
Application Number:	14162133
Application Number:	12444381
Application Number:	12445278
Application Number:	12517525
Application Number:	11897683
Application Number:	12226910
Application Number:	12226939
Application Number:	14952635
Application Number:	13512262
Application Number:	13254454
Application Number:	13376742
Application Number:	14983367
Application Number:	12402339
Application Number:	14242164
Application Number:	13696798
Application Number:	13511632
Application Number:	13610195
Application Number:	15188959
Application Number:	13995900
Application Number:	13995901
Application Number:	12028738
Application Number:	13554945
Application Number:	14365604
Application Number:	14385679
Application Number:	14740123

Property Type	Number
Application Number:	14356581
Application Number:	14362584
Application Number:	14362585
Application Number:	14399151
Application Number:	14384366
Application Number:	14384368
Application Number:	14394074
Application Number:	14414435
Application Number:	14434073
Application Number:	14434076
Application Number:	14779942
Application Number:	14431774
Application Number:	14414436
Application Number:	14417544
Application Number:	15022778
Application Number:	14443999
Application Number:	14907655
Application Number:	15022752
Application Number:	14786438
Application Number:	15028932
Application Number:	14891320
Application Number:	14910879
Application Number:	15104222
Application Number:	15034856
Application Number:	15115618
Application Number:	14763486
Application Number:	14771789
Application Number:	14767870
PCT Number:	US2015011470
PCT Number:	US2014040402
PCT Number:	US2014044912
PCT Number:	US2014040404
PCT Number:	US2014053008
PCT Number:	US2014053002
PCT Number:	US2014063256
PCT Number:	US2014068666
PCT Number:	US2015052014
PCT Number:	US2015052044

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NAME OF SUBMITTER:	SCOTT KAREFF (050319-0040)
SIGNATURE:	/kc for sk/
DATE SIGNED:	12/05/2016

Total Attachments: 65
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GRANT OF A SECURITY INTEREST -- PATENTS

This Patent Security Agreement (this "Patent Security Agreement") is made as of December 1, 2016, by ASSIA SPE, LLC (the "Grantor"), in favor of MGG California LLC, in its capacity as collateral agent for itself and the other Secured Parties (together with its successors and assigns in such capacity, "Grantee").

WHEREAS, the Grantor holds all right, title and interest in the letter patents, design patents and utility patents listed on the attached Schedule A, which patents are issued or applied for in the United States Patent and Trademark Office (the "Patents");

WHEREAS, the Grantor has entered into a Pledge and Security Agreement, dated December 1, 2016 (as amended, restated, supplemented, modified or otherwise changed from time to time, the "Security Agreement"), in favor of Grantee; and

WHEREAS, pursuant to the Security Agreement, the Grantor has granted to the Grantee for the benefit of the Secured Parties (as defined in the Security Agreement), a continuing security interest in all right, title and interest of the Grantor in, to and under the Patents and the applications and registrations thereof, and all proceeds thereof, including, without limitation, any and all causes of action which may exist by reason of infringement thereof and any and all damages arising from past, present and future violations thereof (the "Collateral"), to secure the payment, performance and observance of the Secured Obligations (as defined in the Security Agreement).

NOW, THEREFORE, as collateral security for the payment, performance and observance of all of the Secured Obligations, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Grantor does hereby grant to the Grantee for the benefit of the Secured Parties, a continuing security interest in the Collateral to secure the prompt payment, performance and observance of the Secured Obligations.

All capitalized terms used but not otherwise defined herein have the meanings given to them in the Security Agreement

The Grantor does hereby further acknowledge and affirm that the rights and remedies of the Grantee with respect to the Collateral are more fully set forth in the Security Agreement, the terms and provisions of which are hereby incorporated herein by reference as if fully set forth herein.

This Patent Security Agreement shall be construed under and governed by the laws of the State of New York, and may be executed in any number of counterparts and by different parties in separate counterparts, each of which when so executed shall be deemed to be an original and all of which taken together shall constitute one and the same agreement. Delivery of an executed counterpart by facsimile or electronic mail shall be equally effective as delivery of an original executed counterpart.

[*Remainder of page intentionally left blank*]

IN WITNESS WHEREOF, the Grantor has caused this Patent Security Agreement to be duly executed by its officer thereunto duly authorized as of the date first set forth above.

ASSIA SPE, LLC

By: _____

Name: John Cioffi

Title: Chief Executive Officer

SCHEDULE A TO GRANT OF A SECURITY INTEREST

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
1.	10/817,128	7,302,379	USA	12/07/2003	4/2/2004	11/27/2007	SPE	DSL System Estimation and Parameter Recommendation	
2.	2004298117	2004298117	Australia	12/07/2003	12/2/2004	6/3/2010	SPE	DSL System Estimation and Parameter Recommendation	
3.	04801291.8	1700423	Belgium	12/07/2003	12/2/2004	11/16/2011	SPE	DSL System Estimation and Parameter Recommendation	
4.	11/945,210	7,711,530	USA	12/07/2003	11/26/2007	5/4/2010	SPE	DSL System Estimation and Parameter Recommendation	
5.	2,548,736		Canada	12/07/2003	6/5/2006		SPE	DSL System Estimation and Parameter Recommendation	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
6.	04801291.8	1700423	Switzerland	12/07/2003	12/2/2004	11/16/2011	SPE	DSL System Estimation and Parameter Recommendation	
7.	200480041373.8	1914855	China	12/07/2003	8/4/2006	7/18/2012	SPE	DSL System Estimation and Parameter Recommendation	
8.	201210184575.4		China	12/07/2003	6/6/2012		SPE	DSL SYSTEM ESTIMATION AND PARAMETER RECOMMENDATION	
9.	04801291.8	1700423	Germany (3)	12/07/2003	12/2/2004	11/16/2011	SPE	DSL System Estimation and Parameter Recommendation	
10.	04801291.8	1700423	EPO	12/07/2003	12/2/2004	11/16/2011	SPE	DSL System Estimation and Parameter Recommendation	
11.	10178163.1		EPO	12/07/2003	9/22/2010		SPE	DSL System Estimation and Parameter Recommendation	
12.	04801291.8		France	12/07/2003	12/2/2004	11/16/2011	SPE	DSL System Estimation and Parameter Recommendation	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
13.	04801291.8		United Kingdom	12/07/2003	12/2/2004	11/16/2011	SPE	DSL System Estimation and Parameter Recommendation	
14.	04801291.8	1700423	Italy	12/07/2003	12/2/2004	11/16/2011	SPE	DSL System Estimation and Parameter Recommendation	
15.	2006-542047	4891778	Japan	12/07/2003	6/6/2006	12/22/2011	SPE	DSL System Estimation and Parameter Recommendation	
16.	2011-223089	5519608	Japan	12/07/2003	10/7/2011	4/11/2014	SPE	DSL System Estimation and Parameter Recommendation	
17.	04801291.8	1700423	Netherlands	12/07/2003	12/2/2004	11/16/2011	SPE	DSL System Estimation and Parameter Recommendation	
18.	10/808,771	7,639,596	USA	12/07/2003	3/25/2004	12/29/2009	SPE	High Speed Multiple Loop DSL System	
19.	2005226164	2005226164	Australia	12/07/2003	3/18/2005	9/10/2009	SPE	High Speed Multiple Loop DSL System	
20.	5708773.6	1733550B	Belgium	12/07/2003	3/18/2005	8/3/2011	SPE	High Speed Multiple Loop DSL System	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
21.	2,561,009	2,561,009	Canada	12/07/2003	3/18/2005	7/2/2013	SPE	High Speed Multiple Loop DSL System	
22.	5708773.6	1733550B	Switzerland	12/07/2003	3/18/2005	8/3/2011	SPE	High Speed Multiple Loop DSL System	
23.	200580015585.3	1954586	China	12/07/2003	3/18/2005	11/14/2012	SPE	High Speed Multiple Loop DSL System	
24.	5708773.6	1733550B	Germany (3)	12/07/2003	3/18/2005	8/3/2011	SPE	High Speed Multiple Loop DSL System	
25.	05708773.6	1733550	EPO	03/25/2004	3/18/2005	8/3/2011	SPE	High Speed Multiple Loop DSL System	
26.	10182701.2		EPO	12/07/2003	9/29/2010		SPE	High Speed Multiple Loop DSL System	
27.	5708773.6		France	12/07/2003	3/18/2005	8/3/2011	SPE	High Speed Multiple Loop DSL System	
28.	5708773.6		United Kingdom	12/07/2003	3/18/2005	8/3/2011	SPE	High Speed Multiple Loop DSL System	
29.	5708773.6	1733550B	Italy	12/07/2003	3/18/2005	8/3/2011	SPE	High Speed Multiple Loop DSL System	
30.	5708773.6	1733550B	Netherlands	12/07/2003	3/18/2005	8/3/2011	SPE	High Speed Multiple Loop DSL System	
31.	10/919,620	7,535,966	USA	08/17/2004	8/17/2004	5/19/2009	SPE	DSL Data Collection System	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
32.	2005273610	2005273610	Australia	08/17/2004	8/10/2005	8/12/2010	SPE	DSL Data Collection System	
33.	200580030891.4	101019410	China	08/17/2004	3/14/2007	4/3/2013	SPE	A Method and an Apparatus for Transmitting Information from a DSL System Component	
34.	10/922,705	7,573,943	USA	08/20/2004	8/20/2004	8/11/2009	SPE	Interference Cancellation System	
35.	05850646.0	1784923B	Austria	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
36.	2005303552	2005303552	Australia	08/20/2004	2/19/2007	3/25/2010	SPE	INTERFERENCE CANCELLATION SYSTEM	
37.	05850646.0	1784923B	Belgium	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
38.	2,577,489	2,577,489	Canada	08/20/2004	2/16/2007	10/8/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
39.	05850646.0	1784923B	Switzerland	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
40.	200580030892.9	101019333	China	08/20/2004	3/14/2007	6/20/2012	SPE	SYSTEM AND METHOD FOR REMOVING INTERFERENCE NOISE FROM DATA SIGNALS ON TELEPHONE/DSL LINE AND DSL SYSTEM	
41.	05850646.0	1784923B	Germany (3)	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
42.	05850646.0	1784923B	Denmark	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
43.	05850646.0	1784923B	EPO	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
44.	12154413.4		EPO	08/20/2004	2/8/2012		SPE	INTERFERENCE CANCELLATION SYSTEM	
45.	05850646.0	1784923B	Spain	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
46.	05850646.0		France	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
47.	0396/MUMNP/2007	260765	India	08/20/2004	3/15/2007	5/21/2014	SPE	INTERFERENCE CANCELLATION SYSTEM	
48.	05850646.0	1784923B	Italy	08/20/2004	08/10/2005		SPE	INTERFERENCE CANCELLATION SYSTEM	
49.	2007-526598	5049783	Japan	08/20/2004	2/19/2007	7/27/2012	SPE	INTERFERENCE CANCELLATION SYSTEM	
50.	05850646.0	1784923B	Netherlands	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
51.	05850646.0	1784923B	Sweden	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
52.	05850646.0	1784923B	Turkey	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
53.	05850646.0		United Kingdom	08/20/2004	8/10/2005	1/9/2013	SPE	INTERFERENCE CANCELLATION SYSTEM	
54.	10/981,068	7349963	USA	11/04/2004	11/4/2004	3/25/2008	SPE	Communication Device Identification	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
55.	200580040492.6	101073233	China	11/04/2004	5/25/2007	10/27/2010	SPE	Communication Device Identification	
56.	11/069,159	7,809,116	USA	03/01/2005	3/1/2005	10/5/2010	SPE	DSL System Estimation Including Known DSL Line Scanning and Bad Splice Detection Capability	
57.	200680006774.9	101133632	China	03/01/2005	2/28/2006	2/8/2012	SPE	DSL System Estimation Including Known DSL Line Scanning and Bad Splice Detection Capability	
58.	06710513.0		EPO	03/01/2005	2/28/2006		SPE	DSL System Estimation Including Known DSL Line Scanning and Bad Splice Detection Capability	
59.	2007-557621	5068671	Japan	03/01/2005	2/28/2006	8/24/2012	SPE	DSL System Estimation Including Known DSL Line Scanning and Bad Splice Detection Capability	
60.	11/122,365	7,593,458	USA	05/18/2004	5/5/2005	9/22/2009	SPE	FEXT-determination System	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
61.	2005246544	2005246544	Australia	05/18/2004	5/18/2005	3/25/2010	SPE	FEXT DETERMINATION SYSTEM	
62.	05741016.9	1756963	Belgium	05/18/2004	5/18/2005	1/4/2012	SPE	FEXT DETERMINATION SYSTEM	
63.	2,566,499	2,566,499	Canada	05/18/2004	5/18/2005	12/17/2013	SPE	FEXT DETERMINATION SYSTEM	
64.	2,829,307		Canada	05/18/2004	10/3/2013		SPE	FEXT DETERMINATION SYSTEM	
65.	5741016.9	1756963	Switzerland	05/18/2004	5/18/2005	1/4/2012	SPE	FEXT DETERMINATION SYSTEM	
66.	200580018584.4	1965498	China	05/18/2004	5/18/2005	3/6/2013	SPE	Method and Apparatus of Evaluating Operational Character of a Multi-line, Vectored DSL System	
67.	5741016.9	1756963	Germany (3)	05/18/2004	5/18/2005	1/4/2012	SPE	FEXT DETERMINATION SYSTEM	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
68.	5741016.9	1756963	EPO	05/18/2004	5/18/2005	1/4/2012	SPE	FEXT DETERMINATION SYSTEM	
69.	5741016.9		France	05/18/2004	5/18/2005	1/4/2012	SPE	FEXT DETERMINATION SYSTEM	
70.	5741016.9		United Kingdom	05/18/2004	5/18/2005	1/4/2012	SPE	FEXT DETERMINATION SYSTEM	
71.	1387/MUMNP/2006	254648	India	05/18/2004	5/18/2005	11/30/2012	SPE	A Method and a Controller for Evaluating Operational Characteristics of a Multi-Line Vectored DSL System	
72.	5741016.9	1756963	Italy	05/18/2004	5/18/2005	1/4/2012	SPE	FEXT DETERMINATION SYSTEM	
73.	2007-517505	5057971	Japan	05/18/2004	5/18/2005	8/10/2012	SPE	FEXT DETERMINATION SYSTEM	
74.	5741016.9	1756963	Netherlands	05/18/2004	5/18/2005	1/4/2012	SPE	FEXT DETERMINATION SYSTEM	
75.	11/267,623	7,773,497	USA	05/09/2005	11/4/2005	8/10/2010	SPE	Phantom Use in DSL Systems	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
76.	200680022004.3	101218776	China	05/09/2005	2/28/2006	10/10/2012	SPE	Phantom Use in DSL Systems	
77.	201210299479.4		China	05/09/2005	8/21/2012		SPE	Phantom Use in DSL Systems	
78.	12/853,209	8,310,914	USA	05/09/2005	8/9/2010	11/13/2012	SPE	Phantom Use in DSL Systems	
79.	06710503.1		EPO	05/09/2005	2/28/2006		SPE	Phantom Use in DSL Systems	
80.	2008-510655	4918087	Japan	05/09/2005	2/28/2006	2/3/2012	SPE	Phantom Use in DSL Systems	
81.	11/284,692	7,774,398	USA	05/10/2005	11/22/2005	8/10/2010	SPE	Tonal Rotors	
82.	200680020813.0	101248431	China	05/10/2005	2/28/2006	10/26/2011	SPE	QR DECOMPOSITION IN DSL EQUALIZERS USING REAL GIVENS ROTATIONS	
83.	11/336,113	7,813,420	USA	06/02/2005	1/20/2006	10/12/2010	SPE	Adaptive GDFE	
84.	200680023058.1	101248636	China	06/02/2005	3/17/2006	10/10/2012	SPE	Adaptive GDFE	
85.	06727480.3		EPO	06/02/2005	3/17/2006		SPE	Adaptive GDFE	
86.	2008-514213	4891992	Japan	06/02/2005	3/17/2006	12/22/2011	SPE	Adaptive GDFE	
87.	11/344,873	7,852,952	USA	06/10/2005	2/1/2006	12/14/2010	SPE	DSL System Loading and Ordering	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
88.	200680027325.2	101238693	China	06/10/2005	3/16/2006	3/28/2012	SPE	DSL System Loading and Ordering	
89.	06744467.9	1894377B	Germany (3)	06/10/2005	3/16/2006	1/26/2011	SPE	DSL System Loading and Ordering	
90.	06744467.9	1894377B	EPO	06/10/2005	3/16/2006	1/26/2011	SPE	DSL System Loading and Ordering	
91.	06744467.9		France	06/10/2005	3/16/2006	1/26/2011	SPE	DSL System Loading and Ordering	
92.	06744467.9		United Kingdom	06/10/2005	3/16/2006	1/26/2011	SPE	DSL System Loading and Ordering	
93.	2008-515303	5180069	Japan	06/10/2005	3/16/2006	1/18/2013	SPE	DSL System Loading and Ordering	
94.	11/345,215	7,991,122	USA	06/02/2005	2/1/2006	8/2/2011	SPE	DSL System Training	
95.	2006253892	2006253892	Australia	06/02/2005	3/16/2006	6/23/2011	SPE	DSL System Training	
96.	13/194,736	8,761,348	USA	06/02/2005	7/29/2011	6/24/2014	SPE	DSL System Training	
97.	2,610,811		Canada	06/02/2005	3/16/2006		SPE	DSL System Training	
98.	200680024116.2	101213826	China	06/02/2005	3/16/2006	10/10/2012	SPE	DSL System Training	
99.	201210299535.4		China	06/02/2005	8/21/2012		SPE	DSL System Training	
100.	06710580.9		EPO	06/02/2005	3/16/2006		SPE	DSL System Training	
101.	12179552.0		EPO	06/02/2005	8/7/2012		SPE	DSL System Training	

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102.	2008-514211	5216581	Japan	06/02/2005	3/16/2006	3/8/2013	SPE	DSL System Training	
103.	11/363,769	7,657,818	USA	06/22/2005	2/28/2006	2/2/2010	SPE	DYNAMIC MINIMUM-MEMORY INTERLEAVING	
104.	200680022225.0	101204014	China	06/22/2005	3/16/2006	5/9/2012	SPE	METHOD AND SYSTEM FOR PERFORMING CONVOLUTIONAL INTERLEAVING OF A DATE FLOW	
105.	11/367,930	7,688,884	USA	06/10/2005	3/3/2006	3/30/2010	SPE	Vectored DSL Nesting	
106.	200680020603.1	101194435	China	06/10/2005	3/16/2006	9/7/2011	SPE	VECTORED DSL NESTING	
107.	11/342,024	7,684,546	USA	05/09/2005	1/28/2006	3/23/2010	SPE	DSL System Estimation and Control	
108.	11/342,028	8,073,135	USA	05/10/2005	1/28/2006	12/6/2011	SPE	Binder Identification	
109.	2006245450	2006245450	Australia	05/10/2005	3/16/2006	7/14/2011	SPE	Binder Identification	
110.	2,608,329		Canada	05/10/2005	3/16/2006		SPE	Binder Identification	
111.	200680020929.4	101199196	China	05/10/2005	3/16/2006	12/14/2011	SPE	Binder Identification	
112.	06727455.5		EPO	05/10/2005	3/16/2006		SPE	Binder Identification	

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113.	2008-510657	5049961	Japan	05/10/2005	3/16/2006	7/27/2012	SPE	Binder Identification	
114.	11/341,969	7,881,438	USA	06/02/2005	1/28/2006	2/1/2011	SPE	Self-learning and Self-adjusting DSL System	
115.	200680024128.5	101213827	China	06/02/2005	3/16/2006	10/10/2012	SPE	Self-learning and Self-adjusting DSL System	
116.	11/342,023	8,948,026	USA	06/10/2005	1/28/2006	2/3/2015	SPE	User-Preference-Based DSL System	
117.	200680027103.0	101228776	China	06/10/2005	3/16/2006	1/11/2012	SPE	USER PREFERENCE BASED DSL SYSTEM	
118.	11/342,003	8,972,549	USA	06/10/2005	1/28/2006	3/3/2015	SPE	USER-PREFERENCE-BASED DSL SYSTEM	
119.	2006256483	2006256483	Australia	06/10/2005	3/17/2006	6/30/2011	SPE	USER-PREFERENCE-BASED DSL SYSTEM	
120.	2,611,387		Canada	06/10/2005	3/17/2006		SPE	USER-PREFERENCE-BASED DSL SYSTEM	
121.	200680027629.9	101233742	China	06/10/2005	3/17/2006	8/3/2011	SPE	USER-PREFERENCE-BASED DSL SYSTEM	
122.	14/630,569	9178777	USA	06/10/2005	1/28/2006		SPE	USER-PREFERENCE-BASED DSL SYSTEM	
123.	06727414.2		EPO	06/10/2005	3/17/2006		SPE	USER-PREFERENCE-BASED DSL SYSTEM	

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124.	12183299.2		EPO	06/10/2005	9/6/2012		SPE	USER-PREFERENCE-BASED DSL SYSTEM	
125.	2008-515304	4928546	Japan	06/10/2005	3/17/2006	2/17/2012	SPE	USER-PREFERENCE-BASED DSL SYSTEM	
126.	12/089,044	8,009,665	USA	10/04/2005	10/3/2006	8/30/2011	SPE	DSL System	
127.	200680036556.X	102099779	China	10/04/2005	10/3/2006	5/21/2014	SPE	DSL System	
128.	13/214,598	9203724	USA	10/04/2005	8/22/2011		SPE	DSL System	
129.	14/685,522		USA	10/04/2005	04/13/2015		SPE	DSL System	
130.	06816102.5		EPO	10/04/2005	10/3/2006		SPE	DSL System	
131.	2008-534622	4980362	Japan	10/04/2005	10/3/2006	4/27/2012	SPE	DSL System	
132.	12/227,966	8,483,369	USA	06/06/2006	6/6/2007	7/9/2013	SPE	DSL SYSTEM	
133.	14/605,911		USA	06/06/2006	1/26/2015		SPE	SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING A DSL SYSTEM	
134.	200780021083.0	101461253	China	06/06/2006	6/6/2007	5/25/2011	SPE	VECTORED DSL SYSTEM	
135.	201110078482.9		China	06/06/2006	3/28/2011		SPE	VECTORED DSL SYSTEM	
136.	07795837.9	2030454	Germany (3)	06/06/2006	6/6/2007	8/10/2011	SPE	DSL SYSTEM	

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137.	07795837.9	2030454	EPO	06/06/2006	6/6/2007	8/10/2011	SPE	DSL SYSTEM	
138.	07795837.9		EPO	06/06/2006	4/6/2011		SPE	DSL SYSTEM	
139.	11161331.1		EPO	06/06/2006	4/6/2011		SPE	DSL SYSTEM	
140.	07795837.9	2030454	France	06/06/2006	6/6/2007	8/10/2011	SPE	DSL SYSTEM	
141.	07795837.9	2030454	United Kingdom	06/06/2006	6/6/2007	8/10/2011	SPE	DSL SYSTEM	
142.	2009-514370	5203359	Japan	06/06/2006	6/6/2007	2/22/2013	SPE	VECTORED DSL SYSTEM	
143.	11/995,194	7,924,736	USA	07/10/2005	7/8/2006	4/12/2011	SPE	DSL System Estimation	
144.	2006268292	2006268292	Australia	07/10/2005	7/8/2006	7/7/2011	SPE	DSL System Estimation	
145.	13/084,829	9,071,534	USA	07/10/2005	4/12/2011	6/30/2015	SPE	DSL System Estimation	
146.	200680027968.7	101233721	China	07/10/2005	7/8/2006	7/16/2014	SPE	DSL System Estimation	
147.	201410276353.4		China	07/10/2005	6/19/2014		SPE	DSL System Estimation	
148.	06786826.5		EPO	07/10/2005	7/8/2006		SPE	DSL System Estimation	

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149.	2008-521505	4891995	Japan	07/10/2005	7/8/2006	12/22/2011	SPE	DSL System Estimation	
150.	2011-055791	5401494	Japan	07/10/2005	3/14/2011	11/1/2013	SPE	DSL System Estimation	
151.	11/995,195	7,830,955	USA	07/10/2005	7/8/2006	11/9/2010	SPE	Adaptive Margin and Band Control	
152.	2006268293	2006268293	Australia	07/10/2005	7/8/2006	6/30/2011	SPE	Adaptive Margin and Band Control	
153.	12/940,970	8,031,761	USA	07/10/2005	11/5/2010	10/4/2011	SPE	Adaptive Margin and Band Control	
154.	2,614,942		Canada	07/10/2005	7/8/2006		SPE	Adaptive Margin and Band Control	
155.			Canada	07/10/2005			SPE	Adaptive Margin and Band Control	
156.	200680028879.4		China	07/10/2005	7/8/2006		SPE	Adaptive Margin and Band Control	
157.	201510088758.X		China	07/10/2005	2/26/2015		SPE	Method and Apparatus for Adaptive Margin and Band Control	
158.	06786827.3		EPO	07/10/2005	7/8/2006		SPE	Adaptive Margin and Band Control	
159.	2008-521506	4921468	Japan	07/10/2005	7/8/2006	2/10/2012	SPE	Adaptive Margin and Band Control	

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160.	12/375,216	8,428,225	USA	07/31/2006	7/31/2007	4/23/2013	SPE	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE	
161.	200780028511.2	101785202	China	07/31/2006	7/31/2007	5/22/2013	SPE	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE	
162.	201310141631.0		China	07/31/2006	4/22/2013		SPE	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE	
163.	14/162,133	9391744	USA	07/31/2006	1/23/2014		SPE	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE	
164.	07810931.1		EPO	07/31/2006	7/31/2007		SPE	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE	

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165.	2009-522833	5179495	Japan	07/31/2006	7/31/2007	1/18/2013	SPE	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE	
166.	12/444,381	8,340,279	USA	10/05/2006	10/5/2007	12/25/2012	SPE	Interference Cancellation System	
167.	200780041516.9		China	10/05/2006	10/5/2007		SPE	Interference Cancellation System	
168.	07852551.6		EPO	10/05/2006	10/5/2007		SPE	Interference Cancellation System	
169.	2009-531465	5242578	Japan	10/05/2006	10/5/2007	4/12/2013	SPE	Interference Cancellation System	
170.	12/445,278	8,842,527	USA	10/11/2006	4/10/2009	9/23/2014	SPE	HIGH SPEED MULTIPLE USER MULTIPLE LOOP DSL SYSTEM	
171.	2007308107	2007308107	Australia	10/11/2006	10/11/2007	12/13/2012	SPE	HIGH SPEED MULTIPLE USER MULTIPLE LOOP DSL SYSTEM	
172.	2,666,372		Canada	10/11/2006	4/14/2009		SPE	HIGH SPEED MULTIPLE USER MULTIPLE LOOP DSL SYSTEM	

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173.	200780041916.X	101536482	China	10/11/2006	5/11/2009	1/29/2014	SPE	HIGH SPEED MULTIPLE USER MULTIPLE LOOP DSL SYSTEM	
174.	07852679.5		EPO	10/11/2006	5/7/2009		SPE	HIGH SPEED MULTIPLE USER MULTIPLE LOOP DSL SYSTEM	
175.	2009-532424	5254237	Japan	10/11/2006	4/9/2009	4/26/2013	SPE	HIGH SPEED MULTIPLE USER MULTIPLE LOOP DSL SYSTEM	
176.	12/517,525	8,363,788	USA	12/07/2006	12/7/2007	1/29/2013	SPE	DSL Ring Signal Compatibility	
177.	200780049233.9	101573951	China	12/07/2006	12/7/2007	12/12/2012	SPE	DSL Ring Signal Compatibility	
178.	11/897,683	8,045,629	USA	08/17/2004	8/30/2007	10/25/2011	SPE	DSL DATA COLLECTION SYSTEM	
179.	200810000214.3	101572760	China	08/17/2004	1/7/2008	12/28/2011	SPE	DSL DATA COLLECTION SYSTEM	

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180.	12/226,910	8,902,958	USA	05/01/2006	4/27/2007	12/2/2014	SPE	Methods and apparatus to combine data from multiple sources to characterize communication systems	
181.	200780019309.3	101523804	China	05/01/2006	4/27/2007	7/24/2013	SPE	Methods and apparatus to combine data from multiple sources to characterize communication systems	
182.	12/226,939	8,644,169	USA	05/01/2006	4/27/2007	2/4/2014	SPE	Methods and apparatus to perform line testing at customer premises	
183.	2007248256	2007248256	Australia	05/01/2006	4/27/2007	11/1/2012	SPE	Methods and apparatus to perform line testing at customer premises	
184.	2,651,247		Canada	05/01/2006	4/27/2007		SPE	Methods and apparatus to perform line testing at customer premises	

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185.	200780021490.1	101523882	China	05/01/2006	12/9/2008	5/21/2014	SPE	Methods and apparatus to perform line testing at customer premises	
186.	07761535.9		EPO	05/01/2006	4/27/2007		SPE	Methods and apparatus to perform line testing at customer premises	
187.	2009-509980	5486923	Japan	05/01/2006	4/27/2007	2/28/2014	SPE	Methods and apparatus to perform line testing at customer premises	
188.	200780021498.8	101517965	China	05/01/2006	4/27/2007	8/21/2013	SPE	Video Streaming Diagnostics	
189.	07761536.7		EPO	05/01/2006	4/27/2007		SPE	Video Streaming Diagnostics	
190.	14952635		USA	05/01/2006			SPE	Video Streaming Diagnostics	* Assignment in process; seeking signature from two inventors who are former service providers; patent is jointly owned.

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191.	13/512,262	9,106,735	USA	11/25/2009	11/25/2009	8/11/2015	SPE	DETECTION OF WIRING DEFECTS	
192.	2009355867		Australia	11/25/2009	11/25/2009		SPE	METHOD AND APPARATUS FOR DETECTION OF WIRING DEFECTS IN A DIGITAL SUBSCRIBER LINE	
193.	2,782,017		Canada	11/25/2009	11/25/2009		SPE	METHOD AND APPARATUS FOR DETECTION OF WIRING DEFECTS IN A DIGITAL SUBSCRIBER LINE	
194.	200980163136.1		China	11/25/2009	11/25/2009		SPE	METHOD AND APPARATUS FOR DETECTION OF WIRING DEFECTS IN A DIGITAL SUBSCRIBER LINE	
195.	09851751.9		EPO	11/25/2009	11/25/2009		SPE	METHOD AND APPARATUS FOR DETECTION OF WIRING DEFECTS IN A DIGITAL SUBSCRIBER LINE	
196.	13/254,454		USA	03/04/2009	11/9/2011		SPE	DSL Noise Cancellation	

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197.	2009341558		Australia	03/04/2009	3/4/2009		SPE	DSL Noise Cancellation	
198.	2016200818		Australia	03/04/2009			SPE	DSL Noise Cancellation	
199.	2,754,351		Canada	03/04/2009	3/4/2009		SPE	DSL Noise Cancellation	
200.	200980158547.1	102379090	China	03/04/2009	3/4/2009	1/21/2015	SPE	DSL Noise Cancellation	
201.	201410817724.5		China	03/04/2009	12/24/2014		SPE	DSL Noise Cancellation	
202.	09789495.0		EPO	03/04/2009	3/4/2009		SPE	DSL Noise Cancellation	
203.	2011-552918	5221778	Japan	03/04/2009	9/2/2011	3/15/2013	SPE	DSL Noise Cancellation	
204.	13/376,742	9241077	USA	07/01/2009	7/1/2009		SPE	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK	
205.	2009348906		Australia	07/01/2009	7/1/2009		SPE	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK	

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206.	2,765,517		Canada	07/01/2009	7/1/2009		SPE	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK	
207.	200980160258.5		China	07/01/2009	7/1/2009		SPE	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK	
208.	09790028.6		EPO	07/01/2009	7/1/2009		SPE	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK	
209.	2012-518520	5612089	Japan	07/01/2009	7/1/2009	9/12/2014	SPE	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK	
210.	14/983,367		USA	07/01/2009			SPE	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK	

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211.	12/402,339	8,730,785	USA	03/11/2009	3/11/2009	5/20/2014	SPE	METHOD AND APPARATUS FOR REDUCING NOISE IN A COMMUNICATION SYSTEM	
212.	14/242,164	9356654	USA	03/11/2009	4/1/2014		SPE	METHOD AND APPARATUS FOR REDUCING NOISE IN A COMMUNICATION SYSTEM	
213.	201080011518.5		China	03/11/2009	2/19/2010		SPE	METHOD AND APPARATUS FOR REDUCING NOISE IN A COMMUNICATION SYSTEM	
214.	2011-554065	5615850	Japan	03/11/2009	2/19/2010	9/19/2014	SPE	METHOD AND APPARATUS FOR REDUCING NOISE IN A COMMUNICATION SYSTEM	
215.	13/696,798	8,792,620	USA	05/10/2010	5/10/2010	7/29/2014	SPE	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING	

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216.	2010352855		Australia	05/10/2010	5/10/2010		SPE	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING	
217.	13/696,798	8,792,620	USA	05/10/2010			SPE	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING	
218.	2,798,809		Canada	05/10/2010	5/10/2010		SPE	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING	
219.	201080066733.5		China	05/10/2010	5/10/2010		SPE	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING	
220.	10719703.0		EPO	05/10/2010	5/10/2010		SPE	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING	
221.	2013-510053	5632535	Japan	05/10/2010	5/10/2010	10/17/2014	SPE	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING	
222.	13/511,632	9344294	USA	11/02/2009	11/2/2010		SPE	Device Abstraction Proxy	

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223.	2010313127		Australia	11/02/2009	11/2/2010		SPE	Device Abstraction Proxy Device	
224.	2,779,631		Canada	11/02/2009	11/2/2010		SPE	Device Abstraction Proxy	
225.	201080056377.9		China	11/02/2009	11/2/2010		SPE	DEVICE ABSTRACTION PROXY	
226.	13/610,195	9374240	USA	11/02/2009	9/11/2012		SPE	Device Abstraction Proxy	
227.	15/188,959		USA	11/02/2009	06/21/2016		SPE	Device Abstraction Proxy	
228.	10785244.4		EPO	11/02/2009	11/2/2010		SPE	Device abstraction proxy	
229.	12189530.4		EPO	11/02/2009	10/23/2012		SPE	Device abstraction proxy	
230.	2012-537954	5710636	Japan	11/02/2009	11/2/2010	3/13/2015	SPE	Device Abstraction Proxy	
231.	13/995,900	9369370	USA	01/12/2011	1/12/2011		SPE	Systems and Methods for Jointly Optimizing WAN and LAN Network Communications	

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232.	2011354759		Australia	01/12/2011	1/12/2011		SPE	Systems and Methods for Jointly Optimizing WAN and LAN Network Communications	
233.	2,823,295		Canada	01/12/2011	1/12/2011		SPE	Systems and Methods for Jointly Optimizing WAN and LAN Network Communications	
234.	201180064927.6		China	01/12/2011	1/12/2011		SPE	Systems and Methods for Jointly Optimizing WAN and LAN Network Communications	
235.	11700879.7		EPO	01/12/2011	1/12/2011		SPE	Systems and Methods for Jointly Optimizing WAN and LAN Network Communications	
236.	15/182,513		Australia	01/12/2011	06/14/2016		SPE	Systems and Methods for Jointly Optimizing WAN and LAN Network Communications	

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237.	13/995,901		USA	12/30/2010	12/30/2010		SPE	MANAGEMENT CENTER FOR COMMUNICATION SYSTEM CUSTOMER PREMISES EQUIPMENT	
238.	2010366637		Australia	12/30/2010	12/30/2010		SPE	MANAGEMENT CENTER FOR COMMUNICATION SYSTEM CUSTOMER PREMISES EQUIPMENT	
239.	2,822,973		Canada	12/30/2010	12/30/2010		SPE	MANAGEMENT CENTER FOR COMMUNICATION SYSTEM CUSTOMER PREMISES EQUIPMENT	
240.	201080071155.4		China	12/30/2010	12/30/2010		SPE	MANAGEMENT CENTER FOR COMMUNICATION SYSTEM CUSTOMER PREMISES EQUIPMENT	
241.	10801361.6		EPO	12/30/2010	12/30/2010		SPE	MANAGEMENT CENTER FOR COMMUNICATION SYSTEM CUSTOMER PREMISES EQUIPMENT	

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242.	12/028,738	8,489,344	USA	02/09/2007	2/8/2008	7/16/2013	SPE	HOME NETWORK SYSTEM AUGMENTATION WITH REMOTE GUIDANCE AND LOCAL SET UP AND MONITORING	
243.	13/554,945	8,589,093	USA	02/09/2007	8/17/2012	11/19/2013	SPE	HOME NETWORK SYSTEM AUGMENTATION WITH REMOTE GUIDANCE AND LOCAL SET UP AND MONITORING	
244.	14/365,604	9391668	USA	12/15/2011	12/15/2011		SPE	Method and Apparatus for Reducing the Power of a Signal Electromagnetically Coupled from a PLC Medium to a DSL Medium	
245.	2011383259		Australia	12/15/2011	12/15/2011		SPE	Method and Apparatus for Reducing the Power of a Signal Electromagnetically Coupled from a PLC Medium to a DSL Medium	

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246.	2,859,524		Canada	12/15/2011	12/15/2011		SPE	Method and Apparatus for Reducing the Power of a Signal Electromagnetically Coupled from a PLC Medium to a DSL Medium	
247.	11808461.5		EPO	12/15/2011	12/15/2011		SPE	Method and Apparatus for Reducing the Power of a Signal Electromagnetically Coupled from a PLC Medium to a DSL Medium	
248.	14/385,679	9,060,054	USA	03/19/2012	3/19/2012	6/16/2015	SPE	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINES	
249.	2012374062		Australia	03/19/2012	3/19/2012		SPE	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINES	

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250.	2,867,845		Canada	03/19/2012	3/19/2012		SPE	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINES	
251.	201280072524.0		China	03/19/2012	3/19/2012		SPE	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINES	
252.	14/740,123	9398146	USA	03/19/2012	6/15/2015		SPE	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINES	
253.	12711318.1		EPO	03/19/2012	3/19/2012		SPE	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINES	
254.	14/356,581		USA	11/10/2011	11/10/2011		SPE	METHOD, APPARATUS, AND SYSTEM FOR OPTIMIZING PERFORMANCE OF A COMMUNICATION UNIT BY A REMOTE SERVER	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
255.	2011380909		Australia	11/10/2011	11/10/2011		SPE	METHOD, APPARATUS, AND SYSTEM FOR OPTIMIZING PERFORMANCE OF A COMMUNICATION UNIT BY A REMOTE SERVER	
256.			Australia	11/10/2011			SPE	METHOD, APPARATUS, AND SYSTEM FOR OPTIMIZING PERFORMANCE OF A COMMUNICATION UNIT BY A REMOTE SERVER	
257.	2,855,461		Canada	11/10/2011	11/10/2011		SPE	METHOD, APPARATUS, AND SYSTEM FOR OPTIMIZING PERFORMANCE OF A COMMUNICATION UNIT BY A REMOTE SERVER	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
258.	201180075399.4		China	11/10/2011	11/10/2011		SPE	METHOD, APPARATUS, AND SYSTEM FOR OPTIMIZING PERFORMANCE OF A COMMUNICATION UNIT BY A REMOTE SERVER	
259.	11787994.0		EPO	11/10/2011	11/10/2011		SPE	METHOD, APPARATUS, AND SYSTEM FOR OPTIMIZING PERFORMANCE OF A COMMUNICATION UNIT BY A REMOTE SERVER	
260.	14/362,584		USA	12/05/2011	12/5/2011		SPE	SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
261.	2011382612		Australia	12/05/2011	12/5/2011		SPE	SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	
262.	2016200393		Australia	12/05/2011			SPE	SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	
263.	2,858,162		Canada	12/05/2011	12/5/2011		SPE	SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
264.	201180076233.4		China	12/05/2011	12/5/2011		SPE	SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	
265.	11802826.5		EPO	12/05/2011	12/5/2011		SPE	SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	
266.	14/362,585		USA	12/05/2011	12/5/2011		SPE	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
267.	2011382613		Australia	12/05/2011	12/5/2011		SPE	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	
268.	2016200291		Australia	12/05/2011			SPE	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	
269.	2,858,030		Canada	12/05/2011	12/5/2011		SPE	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
270.	201180076260.1		China	12/05/2011	12/5/2011		SPE	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	
271.	11797097.0		EPO	12/05/2011	12/5/2011		SPE	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS	
272.	14/399,151	9369232	USA	05/07/2012	5/7/2012		SPE	APPARATUS, SYSTEMS AND METHODS FOR IMPULSE NOISE DETECTION AND MITIGATION	
273.	2012379669		Australia	05/07/2012	5/7/2012		SPE	APPARATUS, SYSTEMS AND METHODS FOR IMPULSE NOISE DETECTION AND MITIGATION	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
274.	2,872,727		Canada	05/07/2012	5/7/2012		SPE	APPARATUS, SYSTEMS AND METHODS FOR IMPULSE NOISE DETECTION AND MITIGATION	
275.	201280073570.2		China	05/07/2012	5/7/2012		SPE	APPARATUS, SYSTEMS AND METHODS FOR IMPULSE NOISE DETECTION AND MITIGATION	
276.	12721143.1		EPO	05/07/2012	5/7/2012		SPE	APPARATUS, SYSTEMS AND METHODS FOR IMPULSE NOISE DETECTION AND MITIGATION	
277.	14/384,366		USA	03/12/2012	3/12/2012		SPE	APPARATUS, SYSTEMS AND METHODS OF COMMON MODE BASED DIAGNOSTICS	
278.	201280072512.8		China	03/12/2012	3/12/2012		SPE	COMMON MODE BASED DIAGNOSTICS	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
279.	201280072381.3		China	03/12/2012	3/12/2012		SPE	METHODS AND SYSTEMS FOR CHARACTERIZING LINE MICRO-FILTER STATES & POSITIONING LINE FAULTS RELATIVE TO A NETWORK INTERFACE DEVICE	
280.	201280073691.7		China	05/03/2012	5/3/2012		SPE	APPARATUS, SYSTEMS AND METHODS FOR DSM ENERGY MANAGEMENT	
281.	201280073451.7		China	04/12/2012	4/12/2012		SPE	SELT AND DELT BASED DIAGNOSTIC METHODS & SYSTEMS FOR TWISTED PAIR TELEPHONE LINES	
282.	201280073639.1		China	04/12/2012	4/12/2012		SPE	SELT BASED DIAGNOSTIC METHODS & SYSTEMS FOR TWISTED PAIR TELEPHONE LINES	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
283.	14/384,368	9391834	USA	03/12/2012	3/12/2012		SPE	APPARATUS, SYSTEMS AND METHODS OF COMMON-MODE REJECTION RATIO BASED DIAGNOSTICS	
284.	201280072517.0		China	03/12/2012	3/12/2012		SPE	APPARATUS, SYSTEMS AND METHODS OF COMMON-MODE REJECTION RATIO BASED DIAGNOSTICS	
285.	14/394,074	9420090	USA	04/13/2012	4/13/2012		SPE	DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS	
286.	201280073314.3		China	04/13/2012	4/13/2012		SPE	DIAGNOSTIC METHODS FOR TW ISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
287.	14/414,435		USA	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK	
288.	2012384930		Australia	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK	
289.	2,879,060		Canada	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK	
290.	201280075813.6		China	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK	
291.	12745938.6		EPO	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
292.	10-2015-7002178		Korea	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK	
293.	2012384931		Australia	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK	
294.	2,879,073		Canada	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK	
295.	201280075723.7		China	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
296.	12743284.7		EPO	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK	
297.	10-2015-7003634		Korea	07/13/2012	7/13/2012		SPE	METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK	
298.	14/434,073		USA	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS	
299.	2012392162		Australia	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
300.	2,887,584		Canada	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS	
301.	201280076950.1		China	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS	
302.	12787194.5		EPO	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS	
303.	10-2015-7011645		Korea	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS	
304.	14/434,076		USA	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
305.	2012392161		Australia	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS	
306.	2,887,576		Canada	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS	
307.	201280076953.5		China	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS	
308.	12780966.3		EPO	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS	
309.	10-2015-7011644		Korea	10/09/2012	10/9/2012		SPE	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
310.	14/779,942		USA	03/25/2013			SPE	METHOD AND APPARATUS FOR IMPLEMENTING WIRELESS SYSTEM DISCOVERY AND CONTROL USING A STATE-SPACE	
311.			EPO	03/25/2013	03/25/2013		SPE	METHOD AND APPARATUS FOR IMPLEMENTING WIRELESS SYSTEM DISCOVERY AND CONTROL USING A STATE-SPACE	
312.			Korea	03/25/2013	03/25/2013		SPE	METHOD AND APPARATUS FOR IMPLEMENTING WIRELESS SYSTEM DISCOVERY AND CONTROL USING A STATE-SPACE	
313.	14/431,774		USA	09/29/2012	9/29/2012		SPE	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
314.	2012391037		Australia	09/29/2012	9/29/2012		SPE	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES	
315.	2,886,147		Canada	09/29/2012	9/29/2012		SPE	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES	
316.	201280076667.9		China	09/29/2012	9/29/2012		SPE	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
317.	12773465.5		EPO	09/29/2012	9/29/2012		SPE	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES	
318.	10-2015-7009199		Korea	09/29/2012	9/29/2012		SPE	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES	
319.	14/414,436		USA	07/13/2012	9/25/2012		SPE	METHOD AND SYSTEM FOR USING A DOWNLOADABLE AGENT FOR A COMMUNICATION SYSTEM, DEVICE, OR LINK	
320.	2012384939		Australia	07/13/2012	9/25/2012		SPE	METHOD AND SYSTEM FOR USING A DOWNLOADABLE AGENT FOR A COMMUNICATION SYSTEM, DEVICE, OR LINK	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
321.			Australia	07/13/2012			SPE	METHOD AND SYSTEM FOR USING A DOWNLOADABLE AGENT FOR A COMMUNICATION SYSTEM, DEVICE, OR LINK	
322.	2,879,047		Canada	07/13/2012	9/25/2012		SPE	METHOD AND SYSTEM FOR USING A DOWNLOADABLE AGENT FOR A COMMUNICATION SYSTEM, DEVICE, OR LINK	
323.	201280075818.9		China	07/13/2012	9/25/2012		SPE	METHOD AND SYSTEM FOR USING A DOWNLOADABLE AGENT FOR A COMMUNICATION SYSTEM, DEVICE, OR LINK	
324.	12773454.9		EPO	07/13/2012	9/25/2012		SPE	METHOD AND SYSTEM FOR USING A DOWNLOADABLE AGENT FOR A COMMUNICATION SYSTEM, DEVICE, OR LINK	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
325.	10-2015-7002636		Korea	07/13/2012	9/25/2012		SPE	METHOD AND SYSTEM FOR USING A DOWNLOADABLE AGENT FOR A COMMUNICATION SYSTEM, DEVICE, OR LINK	
326.	14/417,544		USA	07/27/2012	10/12/2012		SPE	Management System and Methods of Managing Time-Division Duplex (TDD) Transmission over Copper	
327.	2012385953		Australia	07/27/2012	10/12/2012		SPE	Management System and Methods of Managing Time-Division Duplex (TDD) Transmission over Copper	
328.	2016204999		Australia	07/27/2012	07/15/2016		SPE	Management System and Methods of Managing Time-Division Duplex (TDD) Transmission over Copper	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
329.	2,880,267		Canada	07/27/2012	10/12/2012		SPE	Management System and Methods of Managing Time-Division Duplex (TDD) Transmission over Copper	
330.	201280075697.8		China	07/27/2012	10/12/2012		SPE	Management System and Methods of Managing Time-Division Duplex (TDD) Transmission over Copper	
331.	12784144.3		EPO	07/27/2012	10/12/2012		SPE	Management System and Methods of Managing Time-Division Duplex (TDD) Transmission over Copper	
332.	10-2015-7004853		Korea	07/27/2012	10/12/2012		SPE	Management System and Methods of Managing Time-Division Duplex (TDD) Transmission over Copper	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
333.	13771728.6		EPO	09/23/2013			SPE	APPARATUS, SYSTEMS AND METHODS FOR IMPLEMENTING IMPULSE NOISE MITIGATION VIA SOFT SWITCHING	
334.	15,022,778		USA		03/17/2016		SPE	APPARATUS, SYSTEMS AND METHODS FOR IMPLEMENTING IMPULSE NOISE MITIGATION VIA SOFT SWITCHING	
335.	14/443,999		USA	11/19/2012	11/19/2012		SPE	SYSTEMS, METHODS, AND APPARATUSES FOR OPTIMIZING DSL LINE CONFIGURATIONS AND PARAMETERS IN A DSL SYSTEM	
336.	14/907,655		USA				SPE	METHOD AND APPARATUS FOR CONTINUOUS ACCESS NETWORK MONITORING AND PACKET LOSS ESTIMATION	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
337.	15/022,752		USA	09/30/2013	03/17/2016		SPE	System and Method for Validating Broadband Service Recommendation	
338.	14/786,438		USA	04/23/2013	04/23/2013		SPE	Methods, Systems, and Apparatuses for implementing Upstream Power Control for DSL	
339.	13721852.5		EPO	04/23/2013	04/23/2013		SPE	Methods, Systems, and Apparatuses for implementing Upstream Power Control for DSL	
340.	15/028,932		USA	10/15/2013			SPE	Automatic Broadband Information Correlation & Record Generation	* Assignment in process; seeking signature from one inventor who is a former service provider.
341.	14/891,320		USA	05/14/2013			SPE	DSL Neighborhood Diagnostics	
342.	13763375.6		EPO	08/30/2013			SPE	Low Power System and Method for DSL Lines	
343.	14910879		USA	08/30/2013			SPE	Low Power System and Method for DSL Lines	* Assignment in process.

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
344.	15/104,222		USA	12/17/2013	06/13/2016		SPE	Systems, Methods, and Apparatuses for Implementing Distributed Wireless Data Sharing and Control Systems	
345.	15034856		USA	11/07/2013			SPE	Method and Apparatus for Diagnosing and Configuring a Broadband Connection Via an Alternate Communication Path	* Assignment in process; seeking signatures from two inventors who are former service providers.
346.	15/115,618		USA	01/30/2014	07/29/2016		SPE	Systems, Methods, and Apparatuses for Identifying Cable-Level Faults in a Copper Plant of a DSL System	
347.	14/763,486		USA	01/25/2013	1/24/2014		SPE	METHOD AND APPARATUS FOR CLOUD SERVICES FOR ENHANCING BROADBAND EXPERIENCE	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
348.	2014209180		Australia	01/25/2013			SPE	METHOD AND APPARATUS FOR CLOUD SERVICES FOR ENHANCING BROADBAND EXPERIENCE	
349.	2,899,419		Canada	01/25/2013	1/24/2014		SPE	METHOD AND APPARATUS FOR CLOUD SERVICES FOR ENHANCING BROADBAND EXPERIENCE	
350.	201480017623.8		China	01/25/2013			SPE	METHOD AND APPARATUS FOR CLOUD SERVICES FOR ENHANCING BROADBAND EXPERIENCE	
351.	14743423.7		EPO	01/25/2013			SPE	METHOD AND APPARATUS FOR CLOUD SERVICES FOR ENHANCING BROADBAND EXPERIENCE	
352.	5038/CHENP/2015		India	01/25/2013			SPE	METHOD AND APPARATUS FOR CLOUD SERVICES FOR ENHANCING BROADBAND EXPERIENCE	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
353.	10-2015-7022426		Korea	01/25/2013			SPE	METHOD AND APPARATUS FOR CLOUD SERVICES FOR ENHANCING BROADBAND EXPERIENCE	
354.	13711198.5		EPO	03/01/2013			SPE	SYSTEMS AND METHODS FOR MANAGING MIXED DEPLOYMENTS OF VECTORED AND NON-VECTORED VDSL	
355.	14/771,789		USA	03/01/2013			SPE	SYSTEMS AND METHODS FOR MANAGING MIXED DEPLOYMENTS OF VECTORED AND NON-VECTORED VDSL	
356.	14/767,870		USA	02/14/2013			SPE	CHURN PREDICTION IN A BROADBAND NETWORK	
357.			China	02/14/2013			SPE	CHURN PREDICTION IN A BROADBAND NETWORK	
358.	14751236.2		EPO	02/14/2013			SPE	CHURN PREDICTION IN A BROADBAND NETWORK	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
359.	5472/CHENP/2015		India	02/14/2013			SPE	CHURN PREDICTION IN A BROADBAND NETWORK	
360.			Japan	02/14/2013			SPE	CHURN PREDICTION IN A BROADBAND NETWORK	
361.	PCT/US2013/033682		WIPO		3/25/2013		SPE	METHOD AND APPARATUS FOR IMPLEMENTING WIRELESS SYSTEM DISCOVERY AND CONTROL USING A STATE-SPACE	
362.	PCT/US2013/061195		WIPO	09/23/2013	9/23/2013		SPE	APPARATUS, SYSTEMS AND METHODS FOR IMPLEMENTING IMPULSE NOISE MITIGATION VIA SOFT SWITCHING	
363.	PCT/US2013/053057		WIPO	07/31/2013	7/31/2013		SPE	Method and Apparatus for Continuous Access Network Monitoring and Packet Loss Estimation	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
364.	PCT/US2013/062 691		WIPO	09/30/2013	9/30/2013		SPE	System and Method for Validating Broadband Service Recommendation	
365.	PCT/US2013/037 805		WIPO	04/23/2013	4/23/2013		SPE	Methods, Systems, and Apparatuses for implementing Upstream Power Control for DSL	
366.	PCT/US2013/064 994		WIPO	10/15/2013	10/15/2013		SPE	Automatic Broadband Information Correlation & Record Generation	
367.	PCT/US2013/041 016		WIPO	05/14/2013	5/14/2013		SPE	DSL Neighborhood Diagnostics	
368.	PCT/US2013/057 672		WIPO	08/30/2013	8/30/2013		SPE	Low Power System and Method for DSL Lines	
369.	PCT/US2013/075 874		WIPO	12/17/2013	12/17/2013		SPE	Systems, Methods, and Apparatuses for Implementing Distributed Wireless Data Sharing and Control Systems	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
370.	PCT/US2013/068 943		WIPO	11/07/2013	11/7/2013		SPE	Method and Apparatus for Diagnosing and Configuring a Broadband Connection Via an Alternate Communication Path	
371.	PCT/US2014/013 793		WIPO	01/30/2014	1/30/2014		SPE	Systems, Methods, and Apparatuses for Identifying Cable-Level Faults in a Copper Plant of a DSL System	
372.	PCT/US2015/011 470		WIPO	01/14/2015	1/14/2015		SPE	Systems, Methods, and Apparatuses for Implementing DSL Line Fault Determination and Localization Via SELT, DELT, and MELT Diagnostics	
373.	PCT/US2014/040 402		WIPO	05/30/2014	5/30/2014		SPE	METHOD AND APPARATUS FOR IMPROVING BROADBAND EXPERIENCE USING CLOUD BASED RECOMMENDATION ENGINE	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
374.	PCT/US2014/044912		WIPO	06/30/2014	6/30/2014		SPE	METHOD AND APPARATUS FOR WI-FI DEVICE TYPE IDENTIFICATION AND DEVICE TYPE BASED DIAGNOSTICS AND OPTIMIZATION	
375.	PCT/US2014/040404		WIPO	05/30/2014	5/30/2014		SPE	METHOD AND APPARATUS FOR GENERATING POLICIES FOR IMPROVING NETWORK SYSTEM PERFORMANCE	
376.	PCT/US2014/053008		WIPO	08/27/2014	8/27/2014		SPE	SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING VIRTUALIZATION OF ACCESS NODE FUNCTIONS	
377.	PCT/US2014/053002		WIPO	08/27/2014	8/27/2014		SPE	Systems, Methods, and Apparatuses for Implementing Persistent Management Agent (PMA) Functions	

	Application Number	Patent Number	Country	Priority Date	Filing Date	Issue Date	Owner	Title	Assignment Status Note
378.	PCT/US2014/063256		WIPO	10/30/2014	10/30/2014		SPE	METHOD AND APPARATUS FOR PROVIDING PERFORMANCE AND USAGE INFORMATION FOR A WIRELESS AREA NETWORK	
379.	PCT/US2014/068666		WIPO	12/04/2014	12/4/2014		SPE	METHOD AND APPARATUS FOR PREDICTING SUCCESSFUL DSL LINE OPTIMIZATION	
380.	PCT/US2015/052014		WIPO	09/24/2015			SPE	METHOD AND APPARATUS FOR THROUGHPUT TESTING ON A COMMUNICATION CHANNEL	
381.	PCT/US2015/052044		WIPO	09/24/2015			SPE	METHOD AND APPARATUS FOR DETECTING INTERNET CONNECTION PROBLEMS	