# PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT7518737

SUBMISSION TYPE:	RESUBMISSION		
NATURE OF CONVEYANCE:	RELEASE OF SECURITY INTEREST		
RESUBMIT DOCUMENT ID:	507398358		

### **CONVEYING PARTY DATA**

Name	Execution Date
MUZINICH BDC, INC.	05/27/2022

## **RECEIVING PARTY DATA**

Name:	ASSIA SPE, LLC
Street Address:	1209 ORANGE ST.
City:	WILMINGTON
State/Country:	DELAWARE
Postal Code:	19801

### **PROPERTY NUMBERS Total: 165**

Property Type	Number
PCT Number:	US1954135
PCT Number:	US2020242
PCT Number:	US2037654
PCT Number:	US2052928
PCT Number:	US1965560
PCT Number:	US2021515
PCT Number:	US2019039603
Application Number:	14910879
Application Number:	14356581
Application Number:	15506225
Application Number:	16279584
Application Number:	16747270
Application Number:	16900965
Patent Number:	9877724
Application Number:	10795593
Application Number:	10808771
Application Number:	10817128
Application Number:	10893826
Application Number:	10922705

PATENT REEL: 060976 FRAME: 0595

507471844

Property Type	Number
Application Number:	11071762
Application Number:	11122365
Application Number:	11122428
Application Number:	11267623
Application Number:	11284692
Application Number:	11336113
Application Number:	11336666
Application Number:	11341969
Application Number:	11342003
Application Number:	11342023
Application Number:	11342024
Application Number:	11344873
Application Number:	11345215
Application Number:	11363769
Application Number:	11367930
Application Number:	11636316
Application Number:	11897683
Application Number:	11945210
Application Number:	11995194
Application Number:	11995195
Application Number:	12028738
Application Number:	12089044
Application Number:	12185729
Application Number:	12226910
Application Number:	12226939
Application Number:	12227966
Application Number:	12375216
Application Number:	12402339
Application Number:	12444381
Application Number:	12517525
Application Number:	12853209
Application Number:	12940970
Application Number:	13084829
Application Number:	13194736
Application Number:	13214598
Application Number:	13254454
Application Number:	13376742
Application Number:	13511632

Property Type	Number
Application Number:	13512262
Application Number:	13527074
Application Number:	13554945
Application Number:	13610195
Application Number:	13696798
Application Number:	13995900
Application Number:	13995901
Application Number:	14162133
Application Number:	14216573
Application Number:	14242164
Application Number:	14341659
Application Number:	14362584
Application Number:	14362585
Application Number:	14365604
Application Number:	14384368
Application Number:	14385679
Application Number:	14394074
Application Number:	14398069
Application Number:	14399151
Application Number:	14414435
Application Number:	14414437
Application Number:	14417544
Application Number:	14431774
Application Number:	14434073
Application Number:	14434076
Application Number:	14443999
Application Number:	14605911
Application Number:	14630569
Application Number:	14685522
Application Number:	14740123
Application Number:	14763486
Application Number:	14771789
Application Number:	14779942
Application Number:	14786438
Application Number:	14877720
Application Number:	14907655
Application Number:	14952635
Application Number:	14983367

Property Type	Number
Application Number:	15022752
Application Number:	15028932
Application Number:	15034856
Application Number:	15104222
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Application Number:	15144082
Application Number:	15182513
Application Number:	15188959
Application Number:	15315364
Application Number:	15323087
Application Number:	15471779
Application Number:	15505866
Application Number:	15506102
Application Number:	15532976
Application Number:	15543793
Application Number:	15753159
Application Number:	15809823
Application Number:	15864621
Application Number:	16154534
Application Number:	16290073
Application Number:	16290094
Application Number:	16365486
Application Number:	16432364
Application Number:	16516209
Application Number:	14414436
Application Number:	14767870
Application Number:	15845977
Application Number:	15928583
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Application Number:	16040958
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Application Number:	16192442
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Application Number:	16537045
Application Number:	16709857
Application Number:	16804000
Application Number:	16846276
Application Number:	16855986

Property Type	Number
Application Number:	16900940
Application Number:	16916038
Application Number:	16926696
Application Number:	16937566
Application Number:	16937570
Application Number:	16991002
Application Number:	17033437
Application Number:	62861979
Application Number:	62861993
Application Number:	62864869
Application Number:	62907035
Application Number:	62987827
Application Number:	63006628
Application Number:	63023804
Application Number:	63026112
Application Number:	63057806
Application Number:	63069635
Application Number:	63076209
Application Number:	63076263
Application Number:	16024420
Application Number:	16383214
Application Number:	16575101
Application Number:	16577462
Application Number:	16705180
Application Number:	16709620
Application Number:	16741210
Application Number:	16743821
Application Number:	16811593
Application Number:	16882484
Application Number:	16888684
Application Number:	14891320
Application Number:	15315348

## **CORRESPONDENCE DATA**

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

**Phone:** 6508567564

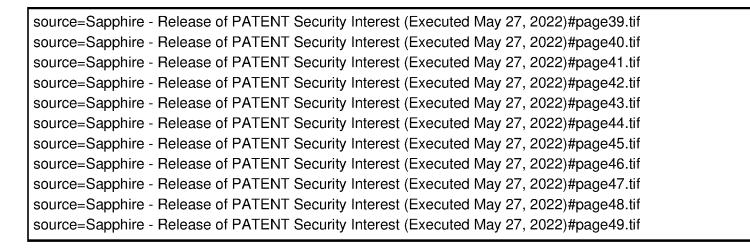
Email: docket1@northweber.com

Correspondent Name: NORTH WEBER & BAUGH LLP
Address Line 1: 2251 GRANT ROAD, SUITE H
LOS ALTOS, CALIFORNIA 94024

ATTORNEY DOCKET NUMBER:	RELEASE SECURITY INTRST
NAME OF SUBMITTER:	DOMARINA ALKHAS
SIGNATURE:	/Domarina Alkhas/
DATE SIGNED:	09/02/2022

**Total Attachments: 49** 

source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page1.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page2.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page3.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page4.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page5.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page6.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page7.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page8.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page9.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page10.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page11.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page12.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page13.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page14.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page15.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page16.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page17.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page18.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page19.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page20.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page21.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page22.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page23.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page24.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page25.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page26.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page27.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page28.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page29.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page30.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page31.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page32.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page33.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page34.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page35.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page36.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page37.tif source=Sapphire - Release of PATENT Security Interest (Executed May 27, 2022)#page38.tif



#### RELEASE OF PATENT SECURITY INTEREST

THIS RELEASE OF PATENT SECURITY INTEREST (this "Release") is made as of May 27, 2022 by Muzinich BDC, Inc., in its capacity as administrative agent (in such capacity, the "Administrative Agent") for the Secured Parties (as defined in the Credit Agreement referred to in the Patent Security Agreement (as defined below)), in favor of the Grantors (as defined below).

#### WITNESSETH:

WHEREAS Adaptive Spectrum and Signal Alignment, Incorporated, a California corporation and ASSIA SPE LLC, a Delaware limited liability company (each a "Grantor" and, together, the "Grantors"), executed that certain Patent Security Agreement, dated as of December 4, 2020 (as amended, restated, supplemented or otherwise modified from time to time, the "Patent Security Agreement") in favor of the Administrative Agent, pursuant to which the Grantors granted a security interest to the Administrative Agent in certain patents and other intellectual property of the Grantors;

WHEREAS, the Patent Security Agreement was recorded by the United States Patent and Trademark Office at Reel: 054593; Frame: 0459 on December 4, 2020, with respect to the patents owned by the Grantors; and

WHEREAS, the Administrative Agent has agreed to terminate and release the entirety of its security interest in all collateral secured by the Patent Security Agreement, including all of its liens on the patent and patent applications of each Grantor identified on Schedule A of the Patent Security Agreement filed in the United States Patent and Trademark Office on December 4, 2020, attached hereto as <a href="Exhibit I">Exhibit I</a> and made a part hereof and any and all patents and patent applications in the United States and throughout the world then owned or subsequently acquired or filed, including without limitation continuations and divisions thereof (the "Released Patent Collateral"), and to reconvey any and all rights in the Released Patent Collateral to the persons legally entitled thereto.

NOW, THEREFORE, in consideration of the promises and other good and valuable consideration, receipt of which is hereby acknowledged, the Administrative Agent hereby releases all its rights in and to the Released Patent Collateral, reconveys to the persons legally entitled thereto all of the Administrative Agent's right, title and interest in and to the Released Patent Collateral, all without warranty or representation of any kind.

[Signature Page Follows]

IN WITNESS WHEREOF, the Administrative Agent has caused this Release to be duly executed on the date first above written.

MUZINICH BDC, INC., as Administrative Agent

Ву:

Name: Jeffrey J. Your

Title CEO

**REEL: 060976 FRAME: 0603** 

# EXHIBIT I

Date Filed - Priority Patent	Grant Date	Country Name	Status	Application#	Patent#	Title
Sep 25, 2020		Argentina	Pending	20200102664		WIRELESS-WIRELINE PHYSICALLY CONVERGED ARCHITECTURES
		J	J			ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Dec 2, 2004	Jul 1, 2010	Australia	Issued	04297733	2004297733	SYSTEM
Dec 2, 2004	Jul 1, 2010	Australia	Issued	2004298118	2004298118	ADAPTIVE FEC CODEWORD MANAGEMENT
Mar 18, 2005	Sep 10, 2009	Australia	Issued	2005226164	2005226164	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
May 18, 2005	Mar 25, 2010	Australia	Issued	2005246544	2005246544	Dynamic management of communication system
Aug 10, 2005	Mar 25, 2010	Australia	Issued	2005303552	2005303552	INTERFERENCE CANCELLATION SYSTEM
Feb 28, 2006	May 12, 2011	Australia	Issued	2006228424	2006228424	DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL
Mar 16, 2006	Jun 23, 2011	Australia	Issued	2006253892	2006253892	DSL SYSTEM TRAINING
Mar 16, 2006	Jun 30, 2011	Australia	Issued	2006253893	2006253893	TONAL PRECODING IN MULTI-USER VECTORED DSL TRANSMISSION
Mar 17, 2006	Jun 30, 2011	Australia	Issued	2006256483	2006256483	USER-PREFERENCE-BASED DSL SYSTEM
	2411 30, 2011	, tooti diid			200230403	SEE. THE ENERGY OF OLD POLOTOTEM
Jul 8, 2006	Jul 7, 2011	Australia	Issued	2006268292	2006268292	DSL SYSTEM
Jul 8, 2006	Jun 30, 2011	Australia	Issued	2006268293	2006268293	ADAPTIVE MARGIN AND BAND CONTROL
Nov 2, 2010	Nov 2, 2010	Australia	lssued	2010313127	2010313127	DEVICE ABSTRACTION PROXY
Dec 15, 2011	Jun 2, 2016	Australia	Issued	2011383259	2011383259	METHOD AND APPARATUS FOR REDUCING THE POWER OF A SIGNAL ELECTROMAGNETICALLY COUPLED FROM A PLC MEDIUM TO A DSL MEDIUM

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent#	Title
M 10, 2012	A 4 2016	A	tania d	2012274062	2012274062	SYSTEM FOR DIAGNOSING AND OPTIMIZING
Mar 19, 2012	Aug 4, 2016	Australia	Issued	2012374062	2012374062	VECTORED DSL LINE
						OPTIMIZED CONTROL SYSTEM FOR AGGREGATION
						OF MULTIPLE BROADBAND CONNECTIONS OVER
Sep 29, 2012	Sep 29, 2012	Australia	Issued	2012391037	2012391037	RADIO INTERFACES
						SYSTEMS AND METHODS FOR TRAFFIC LOAD
Dec 5, 2011	Dec 5, 2011	Australia	Issued	2016200291	2016200291	BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Dec 3, 2011	Dec 3, 2011	Adstraila	133464	2010200251	2010200231	WOLTH LE DISTINCT EAR NETWORKS
						SYSTEMS AND METHODS FOR TRAFFIC
						AGGREGATION ON MULTIPLE WAN BACKHAULS AND
		Australia	Issued	2016200393	2016200393	MULTIPLE DISTINCT LAN NETWORKS
						METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012	Jul 13, 2012	Australia	Issued	2016204112	2016204112	ESTIMATION OF A COMMUNICATION LINK
,	,					
						METHOD AND SYSTEM FOR USING A
						DOWNLOADABLE AGENT FOR A COMMUNICATION
Sep 25, 2012	Mar 22, 2018	Australia	Issued	2016204716	2016204716	SYSTEM, DEVICE, OR LINK
						MANAGEMENT SYSTEM AND METHODS OF
						MANAGING TIME-DIVISION DUPLEX (TDD)
Oct 12, 2012	Sep 13, 2018	Australia	Issued	2016204999	2016204999	TRANSMISSION OVER COPPER
						METHOD AND SYSTEM FOR COMMESTIVITY
Oct 9, 2012	Dec 21, 2017	Australia	Issued	2016206284	2016206284	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS
000 3, 2012	Dec 21, 2017	Australia	133464	2010200204	2010200204	DIAGNOSTICS IN COMMONICATION STSTEMS
						METHOD AND SYSTEM FOR LATENCY MEASUREMENT
Oct 9, 2012	Aug 16, 2019	Australia	Issued	2016213912	2016213912	IN COMMUNICATION SYSTEMS
						SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING
Jan 12, 2011	Jul 5, 2018	Australia	Issued	2016222368	2016222368	WAN AND LAN NETWORK COMMUNICATIONS
·	·					
12 2012	A 16 2010	Aughneli-	ال مديدة	2016222260	2016222260	METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012	Aug 16, 2019	Australia	Issued	2016222369	2016222369	MEASUREMENT OF A COMMUNICATION LINK
						METHOD AND APPARATUS FOR CLOUD SERVICES FOR
Jan 24, 2014	Jun 20, 2019	Australia	Issued	2016266044	2016266044	ENHANCING BROADBAND EXPERIENCE
						SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND
Feb 1, 2018	Feb 13, 2020	Australia	Issued	2018200787	2018200787	MULTIPLE DISTINCT LAN NETWORKS
,						
						METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012	Sep 3, 2020	Australia	Issued	2018267616	2018267616	MEASUREMENT OF A COMMUNICATION LINK
						SYSTEMS AND METHODS FOR TRAFFIC
						AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011		Australia	Pending	2018200888		MULTIPLE DISTINCT LAN NETWORKS

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent#	Title
						SYSTEMS AND METHODS FOR IMPLEMENTING HIGH-
May 2, 2018		Australia	Pending	2018263932		SPEED WAVEGUIDE TRANSMISSION OVER WIRES
Oct 9, 2012		Australia	Donding	2018267677		METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS
Oct 9, 2012		Australia	Pending	201826/6//		IN COMMUNICATION SYSTEMS
Nov 10, 2011		Australia	Pending	2019202408		METHOD, APPARATUS, AND SYSTEM FOR OPTIMIZING PERFORMANCE OF A COMMUNICATION UNIT BY A REMOTE SERVER
Jan 24, 2019		Australia	Pending	2019213577		SYSTEMS AND METHODS FOR NET NEUTRALITY TESTING
Jan 30, 2019		Australia	Pending	2019214925		SYSTEMS AND METHODS FOR BROADBAND COMMUNICATION LINK PERFORMANCE MONITORING
Apr 30, 2020		Australia	Pending	2020202897		SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Apr 30, 2020		Australia	rending	2020202897		WOLTIFEE DISTINCT EAN NETWORKS
Jul 13, 2012		Australia	Pending	2020220132		METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK
			_			
Dec 2, 2004	May 10, 2017	Austria	Issued	04801293.4	1721230	ADAPTIVE MARGIN AND BAND CONTROL
						DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE
Feb 28, 2006	May 23, 2012	Austria	Issued	06755837.9	1869790	PROFILE CONTROL
						DHL SYSTEM ESTIMATION AND PARAMETER
Dec 2, 2004	Nov 16, 2011	Belgium	Issued	04801291.8	1700423	RECOMMENDATION
Dec 2, 2004	Apr 28, 2010	Belgium	Issued	04801294.2	1700410	ADAPTIVE FEC CODEWORD MANAGEMENT
Mar 18, 2005	Aug 3, 2011	Belgium	Issued	05708773.6	1733550	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
, ==	J ,	5				
						_
May 18, 2005	Jan 4, 2012	Belgium	Issued	05741016.9	1756963	Dynamic management of communication system
Feb 28, 2006	Feb 21, 2018	Belgium	Issued	06710503.1	1880503	PHANTOM USE IN DSL SYSTEMS
	·	¥				
NA46 0005		n - l - t		06707405 5	4007055	TONAL PRECODING IN MULTI-USER VECTORED DSL
Mar 16, 2006	May 9, 2018	Belgium	Issued	06727405.0	1897306	TRANSMISSION

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent#	Title
Mar 17, 2006	Sep 13, 2017	Belgium	Issued	06727414.2	1911256	USER-PREFERENCE-BASED DSL SYSTEM
Feb 28, 2006	May 23, 2012	Belgium	Issued	06755837.9	1869790	DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL
reb 28, 2006	IVIAY 23, 2012	beigiuiii	issueu	00733637.3	1809790	PROFILE CONTROL
					60 2006 059	
Oct 3, 2006	Jul 8, 2020	Belgium	Issued	06816102.5	537.9	DSL SYSTEM
						METHOD AND ADDADATHS FOR ANALYZING AND
Jul 31, 2007	Oct 18, 2017	Belgium	Issued	07810931.1	2055086	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE
Oct 5, 2007	Mar 28, 2018	Belgium	Issued	07852551.6	2076972	INTERFERENCE CANCELLATION SYSTEM
,	,	J				
Dec 2, 2004	May 13, 2015	Belgium	Issued	10152127.6	2187558	ADAPTIVE FEC CODEWORD MANAGEMENT
						ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Dec 2, 2004	Nov 9, 2011	Belgium	Issued	10179600.1	2259495	SYSTEM
Mar 18, 2005	May 6, 2020	Belgium	Issued	10182701.2	2278785	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
Nov 2, 2010	Jan 10, 2018	Belgium	Issued	10785244.4	2497226	DEVICE ABSTRACTION PROXY
1404 2, 2010	34H 10, 2010	Deigiairi	issueu	10703244.4	2437220	DEVICE ABSTINCTION I NOXI
Jun 6, 2007	Apr 4, 2018	Belgium	Issued	11161331.1	2337371	VECTORED DSL SYSTEM
						SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011	May 22, 2019	Belgium	Issued	11802826.5	2789134	MULTIPLE DISTINCT LAN NETWORKS
Aug 10, 2005	Oct 4, 2017	Belgium	Issued	12154413.4	2472729	INTERFERENCE CANCELLATION SYSTEM
May 21 2002	Doc 12, 2012	Rolgium	lectrod	12167276 0	2522426	DYNAMIC DIGITAL COMMUNICATION SYSTEM
May 31, 2002	Dec 12, 2012	Belgium	Issued	12167376.8	2533436	CONTROL
Mar 16, 2006	May 27, 2020	Belgium	Issued	12179552.0	2549728	DSL SYSTEM TRAINING
Nov 2, 2010	Apr 11, 2018	Belgium	Issued	12189530.4	2602958	DEVICE ABSTRACTION PROXY

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent#	Title
Mar 19, 2012	Jul 18, 2018	Belgium	Issued	12711318.1	2828977	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINE
·						
Jul 13, 2012	Jan 2, 2019	Belgium	Issued	12743284.7	2873195	METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK
Sep 29, 2012	May 30, 2018	Belgium	Issued	12773465	2901632	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES
30 P 23 ) 23 12	1114, 55, 2515	Jeigiani.	100000	12770100	2502002	10.001011010101010101010101010101010101
Oct 9, 2012	Dec 27, 2017	Belgium	Issued	12780966.3	2907269	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS
Apr 23, 2013	Jun 6, 2018	Belgium	Issued	13721852	3020138	METHODS SYSTEMS, AND APPARATUSES FOR IMPLEMENTING UPSTREAM POWER CONTROL FOR DSL
Dec 17, 2013	Mar 27, 2019	Belgium	Issued	13821031.5	3114891	SYSTEMS METHODS AND APPARATUSES FOR IMPLEMENTING DISTRIBUTED WIRELESS DATA SHARING AND CONTROL SYSTEMS
	2., 2020					
Mar 16, 2006	Jan 17, 2018	Belgium	Issued	067446302		SELF-LEARNING AND SELF-ADJUSTING DSL SYSTEM
Dec 5, 2011	Apr 18, 2018	Belgium	Issued	117970970	2789133	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
0000,2022	7 (5) 20) 2020	J. G.	100000	22/2/03/0	2,05200	
Aug 10, 2005	Jan 9, 2013	Belgium	Issued	2005850646	1784923	INTERFERENCE CANCELLATION SYSTEM
Apr 13, 2012	Feb 21, 2018	Belgium	Issued	2012717538.8	2837168	DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS
Арі 13, 2012	reb 21, 2018	Deigiuiii	issueu	2012/1/338.8	2837108	DISTRIBUTION ANALISIS
Aug 30, 2013	May 6, 2020	Belgium	Issued	2013763375	3039850	LOW POWER SYSTEM AND METHOD FOR DSL LINES
				BR 11 2019		SYSTEMS AND METHODS FOR IMPLEMENTING HIGH-
May 2, 2018		Brazil	Pending	018737 5		SPEED WAVEGUIDE TRANSMISSION OVER WIRES
Jan 30, 2019		Brazil	Pending	BR 11 2020 015685 0		SYSTEMS AND METHODS FOR BROADBAND COMMUNICATION LINK PERFORMANCE MONITORING
Jan 24, 2019		Brazil	Pending	BR 11 2020 015691 4		SYSTEMS AND METHODS FOR NET NEUTRALITY TESTING
Jan 12, 2011		Canada	Allowed	2,823,295		SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING WAN AND LAN NETWORK COMMUNICATIONS
					•	

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent#	Title
				4 P		
Dec 2, 2004	Nov 24, 2015	Canada	Issued	2,548,561	2,548,561	ADAPTIVE MARGIN AND BAND CONTROL
Dec 2, 2004	Nov 24, 2015	Canada	Issued	2,548,743	2,548,743	ADAPTIVE FEC CODEWORD MANAGEMENT
Mar 18, 2005	Jul 2, 2013	Canada	Issued	2,561,009	2,561,009	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
May 18, 2005	Dec 17, 2013	Canada	Issued	2,566,499	2,566,499	FEXT DETERMINATION SYSTEM
Way 10, 2003	Dec 17, 2015	Carrada	133464	2,300,433	2,300,433	TEXT DETERMINATION STSTEM
Aug 10, 2005	Oct 8, 2013	Canada	Issued	2,577,489	2,577,489	INTERFERENCE CANCELLATION SYSTEM
Feb 28, 2006	Amr 15 2014	Canada	laguad	2,599,895	2 500 805	DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE
Feb 28, 2006	Apr 15, 2014	Canaua	Issued	2,399,693	2,599,895	PROFILE CONTROL
Mar 17, 2006	Nov 24, 2015	Canada	Issued	2,611,387	2,611,387	USER-PREFERENCE-BASED DSL SYSTEM
Nov. 2, 2010	lun 16, 2020	Canada	laa.cad	2 770 621	2 770 621	DEVICE A RETRACTION PROVV
Nov 2, 2010	Jun 16, 2020	Canada	Issued	2,779,631	2,779,631	DEVICE ABSTRACTION PROXY
						SYSTEMS AND METHODS FOR TRAFFIC
						AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011	Apr 9, 2019	Canada	Issued	2,858,162	2,858,162	MULTIPLE DISTINCT LAN NETWORKS
						METHOD AND APPARATUS FOR REDUCING THE
D - 45 2011	1 24 2020	6	td	2.050.524	2.050.524	POWER OF A SIGNAL ELECTROMAGNETICALLY
Dec 15, 2011	Jan 21, 2020	Canada	Issued	2,859,524	2,859,524	COUPLED FROM A PLC MEDIUM TO A DSL MEDIUM
						SYSTEM FOR DIAGNOSING AND OPTIMIZING
Mar 19, 2012	May 29, 2018	Canada	Issued	2,867,845	2,867,845	VECTORED DSL LINE
						METHOD AND SYSTEM FOR USING A
Com 2E 2012	Aug 14 2010	Cam	ا ما ما	2 970 047	2 070 047	DOWNLOADABLE AGENT FOR A COMMUNICATION
Sep 25, 2012	Aug 14, 2018	Canada	Issued	2,879,047	2,879,047	SYSTEM, DEVICE, OR LINK
						METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012	Jun 30, 2020	Canada	Issued	2,879,073	2,879,073	MEASUREMENT OF A COMMUNICATION LINK
						MANAGEMENT SYSTEM AND METHODS OF
Oct 12, 2012	Aug 20, 2010	Can-1-	الموردة ا	2 990 267	2 000 267	MANAGING TIME-DIVISION DUPLEX (TDD)
Oct 12, 2012	Aug 20, 2019	Canada	Issued	2,880,267	2,880,267	TRANSMISSION OVER COPPER
						OPTIMIZED CONTROL SYSTEM FOR AGGREGATION
						OF MULTIPLE BROADBAND CONNECTIONS OVER
Sep 29, 2012	Aug 25, 2020	Canada	Issued	2,886,147	2,886,147	RADIO INTERFACES
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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent#	Title
						METHOD AND SYSTEM FOR CONNECTIVITY
Oct 9, 2012	Nov 13, 2018	Canada	Issued	2,887,576	2,887,576	DIAGNOSTICS IN COMMUNICATION SYSTEMS
						METHOD AND SYSTEM FOR LATENCY MEASUREMENT
Oct 9, 2012	Jan 7, 2020	Canada	Issued	2,887,584	2,887,584	IN COMMUNICATION SYSTEMS
0003) 2012	3411 7) 2020	Carraga	133464	2,007,501	2,007,301	III COMMONICATION CONTRACTOR
Nov 2, 2010		Canada	Pending	2779631		DEVICE ABSTRACTION PROXY
						METHOD, APPARATUS, AND SYSTEM FOR
Nov 10, 2011		Canada	Pending	2,855,461		OPTIMIZING PERFORMANCE OF A COMMUNICATION UNIT BY A REMOTE SERVER
100 10, 2011		Cariaua	renuing	2,833,401		ONTE BLA REMOTE SERVER
						METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012		Canada	Pending	2,879,060		ESTIMATION OF A COMMUNICATION LINK
. 24 2044			D 1:	2 000 440		METHOD AND APPARATUS FOR CLOUD SERVICES FOR
Jan 24, 2014		Canada	Pending	2,899,419		ENHANCING BROADBAND EXPERIENCE
						SYSTEMS AND METHODS FOR TRAFFIC
						AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011		Canada	Pending	3,034,504		MULTIPLE DISTINCT LAN NETWORKS
			-			
						MANAGEMENT SYSTEM AND METHODS OF
						MANAGING TIME-DIVISION DUPLEX (TDD)
Oct 12, 2012		Canada	Pending	3,047,928		TRANSMISSION OVER COPPER
						SYSTEMS AND METHODS FOR IMPLEMENTING HIGH-
May 2, 2018		Canada	Pending	3053942		SPEED WAVEGUIDE TRANSMISSION OVER WIRES
			_			
						OPTIMIZED CONTROL SYSTEM FOR AGGREGATION
						OF MULTIPLE BROADBAND CONNECTIONS OVER
Sep 29, 2012		Canada	Pending	3,084,410		RADIO INTERFACES
						SYSTEMS AND METHODS FOR NET NEUTRALITY
Jan 24, 2019		Canada	Pending	3,090,091		TESTING
			-			
						SYSTEMS AND METHODS FOR BROADBAND
1 20 2015			D 1:	2 000 000		COMMUNICATION LINK PERFORMANCE
Jan 30, 2019		Canada	Pending	3,090,099		MONITORING
						METHOD AND SYSTEM FOR PERFORMANCE
Apr 16, 2020		Canada	Pending	P6730CA01		MEASUREMENT OF A COMMUNICATION LINK
			-			
NA 4 0000			Design 1	2.074.005		SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING
Mar 4, 2020		Canada	Published	3,074,395		WAN AND LAN NETWORK COMMUNICATIONS
						SYSTEMS AND METHODS FOR NET NEUTRALITY
Jan 24, 2019		Chile	Pending	1995-2020		TESTING
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Date Filed - Priority Patent	Grant Date	Country Name	Status	Application#	Patent#	Title
Jan 30, 2019		Chile	Pending	1996-2020		SYSTEMS AND METHODS FOR BROADBAND COMMUNICATION LINK PERFORMANCE MONITORING
Jul 13, 2012		China	Allowed	201280075723. 7		METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK
Jul 13, 2012		China	Allowed	201280075813. 6	ZL2012800758 13.6	METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK
Dec 4, 2014	Nov 30, 2020	China	Allowed	201480083855. 3	20148008385 5.3	METHOD AND APPARATUS FOR PREDICTING SUCCESSFUL DSL LINE OPTIMIZATION
Dec 2, 2004	May 26, 2010	China	Issued	200480040960. 5	ZL2004800409 60.5	ADAPTIVE FEC CODEWORD MANAGEMENT
Dec 2, 2004	May 16, 2012	China	Issued	200480041317. 4	ZL2004800413 17.4	ADAPTIVE MARGIN AND BAND CONTROL IN A DSL SYSTEM
Mar 18, 2005	Nov 14, 2012	China	Issued	200580015585. 3	ZL2005800155 85.3	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
May 18, 2005	Mar 6, 2013	China	Issued	200580018584. 4	ZL2005800185 84.4	Dynamic management of communication system
May 18, 2005	Aug 15, 2012	China	Issued	200580018591. 4	ZL2005800185 91.4	INCENTIVE-BASED DSL SYSTEM
Aug 10, 2005	Jun 20, 2012	China	Issued	200580030892. 9	ZL2005800308 92.9	INTERFERENCE CANCELLATION SYSTEM
Feb 28, 2006	Jun 27, 2012	China	Issued	200680007001.	ZL2006800070 01.2	DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL
				200680020603.	ZL2006800206	
Mar 16, 2006	Sep 7, 2011	China	Issued	200680022004.	03.1 ZL2006800220	VECTORED DSL NESTING
Feb 28, 2006	Oct 10, 2012	China	Issued	200680022225.	04.3 ZL2006800222	PHANTOM USE IN DSL SYSTEMS
Mar 16, 2006	May 9, 2012	China	Issued	0	25.0	DYNAMIC MINIMUM-MEMORY INTERLEAVING
Mar 17, 2006	Oct 10, 2012	China	Issued	200680023058. 1	ZL2006800230 58.1	Tonal predictive GDFE

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent#	Title
Mar 16, 2006	Oct 10, 2012	China	lssued	200680024116. 2	ZL2006800241 16.2	DSL SYSTEM TRAINING
Mar 16, 2006	Jan 11, 2012	China	Issued	200680027103. 0	ZL2006800271 03.0	Operator-controlled user-preference-based xDSL system
Mar 16, 2006	Mar 28, 2012	China	Issued	200680027325. 2	ZL2006800273 25.2	DSL SYSTEM LOADING AND ORDERING
Mar 17, 2006	Aug 3, 2011	China	Issued	200680027629. 9	ZL2006800276 29.9	USER-PREFERENCE-BASED DSL SYSTEM
Jul 8, 2006	Jul 16, 2014	China	Issued	200680027968. 7	ZL2006800279 68.7	DSL SYSTEM
Jun 6, 2007	May 25, 2011	China	Issued	200780021083. 0	ZL2007800210 83.0	DSL SYSTEM
Apr 27, 2007	May 21, 2014	China	Issued	200780021490. 1	ZL2007800214 90.1	METHODS AND APPARATUS TO PERFORM LINE TESTING AT CUSTOMER PREMISES
Jul 31, 2007	May 22, 2013	China	Issued	200780028511. 2	ZL2007800285 11.2	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE
Nov 2, 2010	Nov 25, 2015	China	Issued	201080056377. 9	ZL2010800563 77.9	DEVICE ABSTRACTION PROXY
May 10, 2010	Nov 25, 2015	China	Issued	201080066733. 5	ZL2010800667 33.5	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING
Feb 28, 2005	Oct 14, 2015	China	Issued	201210299479. 4	ZL2012102994 79.4	PHANTOM USE IN DSL SYSTEMS
Oct 12, 2012	Sep 21, 2018	China	Issued	201280075697. 8	ZL2012800756 97.8	MANAGEMENT SYSTEM AND METHODS OF MANAGING TIME-DIVISION DUPLEX (TDD) TRANSMISSION OVER COPPER
Oct 9, 2012	Apr 10, 2018	China	Issued	201280076953. 5	ZL2012800769 53.5	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS
Jul 8, 2006	Apr 10, 2018	China	Issued	201410276353. 4	ZL2014102763 53.4	DSL SYSTEM
Sep 29, 2012	Dec 18, 2018	China	Issued	201280076667 9	ZL2012800766 67.9	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title
				200680036556.	ZL2006800365	
Oct 3, 2006	May 21, 2014	China	Issued	X	56.X	DSL SYSTEM
						METHOD, APPARATUS, AND SYSTEM FOR
				201180075399.		OPTIMIZING PERFORMANCE OF A COMMUNICATION
Nov 10, 2011		China	Pending	4		UNIT BY A REMOTE SERVER
						METHOD AND SYSTEM FOR USING A
				201280075818.		DOWNLOADABLE AGENT FOR A COMMUNICATION
Sep 25, 2012		China	Pending	9		SYSTEM, DEVICE, OR LINK
				201280076950.		METHOD AND SYSTEM FOR LATENCY MEASUREMENT
Oct 9, 2012		China	Pending	1		IN COMMUNICATION SYSTEMS
						SYSTEMS, METHODS, AND APPARATUSES FOR
				201480082810.		IMPLEMENTING THE VIRTUALIZATION OF ACCESS
Aug 27, 2014		China	Pending	4		NODE FUNCTIONS
						SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING PERSISTENT MANAGEMENT AGENT
				201480082823.		(PMA) FUNCTIONS FOR THE CONTROL AND
Aug 27, 2014		China	Pending	1		COORDINATION OF DPU AND DSLAM COMPONENTS
						SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING DSL LINE FAULT DETERMINATION
				201580077753.		AND LOCALIZATION VIA SELT, DELT, AND MELT
Jan 14, 2015		China	Pending	5		DIAGNOSTICS
				201580083378.		METHODS AND APPARATUS FOR DETECTING
Sep 24, 2015		China	Pending	5		INTERNET CONNECTION PROBLEMS
						MANAGEMENT SYSTEM AND METHODS OF
				201811187858.		MANAGING TIME-DIVISION DUPLEX (TDD)
Oct 12, 2012		China	Pending	8		TRANSMISSION OVER COPPER
						OPTIMIZED CONTROL SYSTEM FOR AGGREGATION
				201811414162.		OF MULTIPLE BROADBAND CONNECTIONS OVER
Sep 29, 2012		China	Pending	4		RADIO INTERFACES
				201880017852.		SYSTEMS AND METHODS FOR IMPLEMENTING HIGH-
May 2, 2018		China	Pending	8		SPEED WAVEGUIDE TRANSMISSION OVER WIRES
				201910614310.		METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012		China	Pending	5		ESTIMATION OF A COMMUNICATION LINK
				201910863959.		METHOD AND SYSTEM FOR LATENCY MEASUREMENT
Oct 9, 2012		China	Pending	0		IN COMMUNICATION SYSTEMS
						SYSTEMS AND METHODS FOR BROADBAND
				201980011072.		COMMUNICATION LINK PERFORMANCE
Jan 30, 2019		China	Pending	7		MONITORING
						METHOD AND APPARATUS FOR PROVIDING
				201480082947.		PERFORMANCE AND USAGE INFORMATION FOR A
Oct 30, 2014		China	Pending	Х		WIRELESS LOCAL AREA NETWORK

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title
Jul 8, 2006		China	Pending	201510088758. X		ADAPTIVE MARGIN AND BAND CONTROL
Jul 13, 2012		China	Pending	201910653987. X		METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK
Jan 24, 2019		China	Pending	USASS165521		SYSTEMS AND METHODS FOR NET NEUTRALITY TESTING
Oct 24, 2019		China	Published	201911016737. 1		METHOD AND SYSTEM FOR USING A DOWNLOADABLE AGENT FOR A COMMUNICATION SYSTEM, DEVICE, OR LINK
Feb 28, 2006	May 23, 2012	Czech Republic	Issued	06755837.9	1869790	DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL
Feb 28, 2006	May 23, 2012	Denmark	Issued	06755837.9	1869790	DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL
Mar 18, 2005	May 6, 2020	Denmark	Issued	10182701.2	2278785	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
Mar 19, 2012	Jul 18, 2018	Denmark	Issued	12711318.1	2828977	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINE
Dec 2, 2004	Nov 16, 2011	EPO	Issued	04801291.8	1700423	DSL SYSTEM ESTIMATION AND PARAMETER RECOMMENDATION
Dec 2, 2004	100 10, 2011	LIO	issueu	04001231.0	1700423	ILLOWINIENDATION
Dec 2, 2004	May 10, 2017	EPO	Issued	04801293.4	1721230	ADAPTIVE MARGIN AND BAND CONTROL
Dec 2, 2004	Apr 28, 2010	EPO	Issued	04801294.2	1700410	ADAPTIVE FEC CODEWORD MANAGEMENT
Mar 18, 2005	Aug 3, 2011	EPO	Issued	05708773.6	1733550	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
May 18, 2005	Jan 4, 2012	EPO	Issued	05741016.9	1756963	Dynamic management of communication system
May 18, 2005	Jan 14, 2009	EPO	Issued	05747117.9	1757042	INCENTIVE-BASED DSL SYSTEM
Feb 28, 2006	Feb 21, 2018	EPO	Issued	06710503.1	1880503	PHANTOM USE IN DSL SYSTEMS

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title
Mar 16, 2006	May 8, 2019	EPO	Issued	06710580.9	1894401	DSL SYSTEM TRAINING
Mar 16, 2006	May 9, 2018	EPO	Issued	06727405.0	1897306	TONAL PRECODING IN MULTI-USER VECTORED DSL TRANSMISSION
Widi 10, 2000	inay 3, 2010	LIO	133464	00727103.0	1037300	TO WOMED TO T
Mar 17, 2006	Sep 13, 2017	EPO	Issued	06727414.2	1911256	USER-PREFERENCE-BASED DSL SYSTEM
Feb 28, 2006	May 23, 2012	EPO	Issued	06755837.9	1869790	DSL STATE AND LINE PROFILE CONTROL
July 10, 2005	September 2, 2020	EPO	Issued	06786826.5	1905195	DSL SYSTEM
Jul 8, 2006	May 10, 2017	EPO	Issued	06786827.3	1905164	ADAPTIVE MARGIN AND BAND CONTROL
341 0, 2000	Widy 10, 2017	LIO	issaca	00700027.5	1303104	7.67. TVE WARGHTAND BAND CONTROL
Oct 3, 2006	Jul 8, 2020	EPO	Issued	06816102.5	1932076	DSL SYSTEM
						METHOD AND APPARATUS FOR ANALYZING AND
Jul 31, 2007	Oct 18, 2017	EPO	Issued	07810931	2055086	MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE
Oct 5, 2007	Mar 28, 2018	EPO	Issued	07852551.6	2076972	INTERFERENCE CANCELLATION SYSTEM
Jul 1, 2009	Mar 4, 2020	EPO	Issued	09790028.6	2449758	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK
341 1, 2005	10101 1, 2020	LIO	133464	03730020.0	2113730	ENTANGEMENT IN A DOE NET TO SINCE
Dec 2, 2004	May 13, 2015	EPO	Issued	10152127.6	2187558	ADAPTIVE FEC CODEWORD MANAGEMENT
						DYNAMIC DIGITAL COMMUNICATION SYSTEM
May 31, 2002	Dec 8, 2010	EPO	Issued	10178213.4	2259456	CONTROL
Dec 2, 2004	Nov 9, 2011	EPO	Issued	10179600.1	2259495	ADAPTIVE DSL MARGIN AND BAND CONTROL USING HISTORICAL OPERATIONAL DATA
Mar 18, 2005	May 6, 2020	EPO	Issued	10182701.2	2278785	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
, ====	, -, -320					
Nov 2, 2010	Jan 10, 2018	EPO	Issued	10785244.4		DEVICE ABSTRACTION PROXY

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title
Jun 6, 2007	Apr 4, 2018	EPO	Issued	11161331.1	2497226	VECTORED DSL SYSTEM
Jan 12, 2011	Apr 4, 2018	EPO	Issued	11700879.7	2337371	SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING WAN AND LAN NETWORK COMMUNICATIONS
Dec 5, 2011	May 22, 2019	EPO	Issued	11802826.5	2664103	SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
		EPO				METHOD AND APPARATUS FOR REDUCING THE POWER OF A SIGNAL ELECTROMAGNETICALLY
Dec 15, 2011	Aug 19, 2020	EPU	Issued	11808461.5	2789134	COUPLED FROM A PLC MEDIUM TO A DSL MEDIUM
Aug 10, 2005	Oct 4, 2017	EPO	Issued	12154413.4	2792080	INTERFERENCE CANCELLATION SYSTEM
May 31, 2002	Dec 12, 2012	EPO	Issued	12167376.8	2472729	DYNAMIC DIGITAL COMMUNICATION SYSTEM CONTROL
	·					
Mar 16, 2006	May 27, 2020	EPO	Issued	12179552.0	2533436	DSL SYSTEM TRAINING
,	, ,					
Nov 2, 2010	Apr 11, 2018	EPO	Issued	12189530.4	2549728	DEVICE ABSTRACTION PROXY
1100 2, 2010	74pt 11, 2010	El O	Issueu	12105350.4	2343720	DEVICE ABSTINCTION FROM
M 10, 2012	I	FDO	laaad	12711210 1	2602958	SYSTEM FOR DIAGNOSING AND OPTIMIZING
Mar 19, 2012	Jul 18, 2018	EPO	Issued	12711318.1	2602958	VECTORED DSL LINE
Jul 42, 2042	Law 2, 2010	500	11	42742204 7	2020077	METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012	Jan 2, 2019	EPO	Issued	12743284.7	2828977	MEASUREMENT OF A COMMUNICATION LINK
						OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER
Sep 29, 2012	May 30, 2018	EPO	Issued	12773465	2873195	RADIO INTERFACES
						METHOD AND SYSTEM FOR CONNECTIVITY
Oct 9, 2012	Dec 27, 2017	EPO	Issued	12780966.3	2901632	DIAGNOSTICS IN COMMUNICATION SYSTEMS
Apr 23, 2013	Jun 6, 2018	EPO	Issued	13721852	2907269	METHODS SYSTEMS, AND APPARATUSES FOR IMPLEMENTING UPSTREAM POWER CONTROL FOR DSL
, ·,						
Aug 30, 2013	May 6, 2020	EPO	Issued	13763375.6	3020138	LOW POWER SYSTEM AND METHOD FOR DSL LINES
Dec 17, 2013	Mar 27, 2019	EPO	Issued	13821031.5	3039850	SYSTEMS METHODS AND APPARATUSES FOR IMPLEMENTING DISTRIBUTED WIRELESS DATA SHARING AND CONTROL SYSTEMS

Date Filed - Priority Patent	Grant Date	Country Name	Status	Application #	Patent#	Title
Aug 27, 2014	Jul 8, 2020	ЕРО	Issued	14900460.8	3114891	SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING PERSISTENT MANAGEMENT AGENT (PMA) FUNCTIONS FOR THE CONTROL AND COORDINATION OF DPU AND DSLAM COMPONENTS
Oct 30, 2014	Oct 14, 2020	EPO	Issued	14905229.2	3186924	METHOD AND APPARATUS FOR PROVIDING PERFORMANCE AND USAGE INFORMATION FOR A WIRELESS LOCAL AREA NETWORK
Dec 4, 2014	Oct 14, 2020	EPO	Issued	14907600.2	3213548	METHOD AND APPARATUS FOR PREDICTING SUCCESSFUL DSL LINE OPTIMIZATION
May 31, 2002	Nov 8, 2017	EPO	Issued	17172944.5	3228049	DYNAMIC DIGITAL COMMUNICATION SYSTEM CONTROL
Mar 16, 2006	Jan 17, 2018	EPO	Issued	067446302	3242420	SELF-LEARNING AND SELF-ADJUSTING DSL SYSTEM
Mar 4, 2009	Jul 24, 2019	EPO	Issued	097894950	2404385	DSL NOISE CANCELLATION USING SUB-OPTIMAL NOISE REFERENCE SIGNALS
Dec 5, 2011	Apr 18, 2018	EPO	Issued	117970970	2789133	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Dec 3, 2011	7,6, 10, 2010	2.10	133424	11,3,03,0	2,03133	THE CONTROL DAY NETWORKS
Mar 17, 2006	Sep 30, 2020	EPO	Issued	121832992	2560359	USER-PREFERENCE-BASED DSL SYSTEM
Aug 10, 2005	Jan 9, 2013	EPO	Issued	2005850646	1784923	INTERFERENCE CANCELLATION SYSTEM
Mar 17, 2006	May 31, 2017	EPO	Issued	2006727480	1897305	Tonal predictive GDFE
Mar 16, 2006	Jan 26, 2011	EPO	Issued	2006744467		DSL SYSTEM LOADING AND ORDERING
Jun 6, 2007	Aug 10, 2011	EPO	Issued	2007795837	2030454	VECTORED DSL SYSTEM
May 7, 2012	Aug 21, 2019	EPO	Issued	2012721143	2847914	APPARATUS, SYSTEMS AND METHODS FOR IMPULSE NOISE DETECTION AND MITIGATION
Oct 9, 2012	Jul 8, 2020	EPO	Issued	2012787194	2907270	METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS
May 10, 2010	Sep 5, 2018	EPO	Issued	20107197030	2569929	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title
Apr 13, 2012	Feb 21, 2018	EPO	Issued	20127175388	2837168	DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS
Mar 1, 2013	Sep 16, 2020	EPO	Issued	EP13711198.5	2989780	SYSTEMS AND METHODS FOR MANAGING MIXED DEPLOYMENTS OF VECTORED AND NON-VECTORED VDSL
May 30, 2014	Oct 14, 2020	EPO	Issued	EP14893520.8	3149991	METHOD AND APPARATUS FOR GENERATING POLICIES FOR IMPROVING NETWORK SYSTEM PERFORMANCE
Mar 16, 2006		EPO	Pending	11153605.8		TONAL PRECODING IN MULTI-USER VECTORED DSL TRANSMISSION
Feb 28, 2006		EPO	Pending	11155157.8		DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL
Nov 10, 2011		EPO	Pending	11787994.0		METHOD, APPARATUS, AND SYSTEM FOR OPTIMIZING PERFORMANCE OF A COMMUNICATION UNIT BY A REMOTE SERVER
Mar 17, 2006		EPO	Pending	12183299.2		USER-PREFERENCE-BASED DSL SYSTEM
May 3, 2012		EPO	Pending	12722585.2		APPARATUS, SYSTEMS AND METHODS FOR DSM ENERGY MANAGEMENT
Jul 13, 2012		EPO	Pending	12745938.6		METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK
Sep 25, 2012		EPO	Pending	12773454		METHOD AND SYSTEM FOR USING A DOWNLOADABLE AGENT FOR A COMMUNICATION SYSTEM, DEVICE, OR LINK
Oct 12, 2012		EPO	Pending	12784144.3		MANAGEMENT SYSTEM AND METHODS OF MANAGING TIME-DIVISION DUPLEX (TDD) TRANSMISSION OVER COPPER
Nov 19, 2012		EPO	Pending	12795700.9		SYSTEMS, METHODS, AND APPARATUSES FOR OPTIMIZING DSL LINE CONFIGURATIONS AND PARAMETERS IN A DSL SYSTEM
Jul 31, 2013		EPO	Pending	13750984.0		METHOD AND APPARATUS FOR CONTINUOUS ACCESS NETWORK MONITORING AND PACKET LOSS ESTIMATION
Jun 30, 2014		EPO	Pending	14747749.1		METHOD AND APPARATUS FOR WI-FI DEVICE TYPE IDENTIFICATION AND DEVICE TYPE BASED DIAGNOSTICS AND OPTIMIZATION
Aug 27, 2014		EPO	Pending	14900509.2		SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING THE VIRTUALIZATION OF ACCESS NODE FUNCTIONS

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING DSL LINE FAULT DETERMINATION
Jan 14, 2015		EPO	Pending	15878218.5		AND LOCALIZATION VIA SELT, DELT, AND MELT DIAGNOSTICS
Sep 24, 2015		EPO	Pending	15904903.0		METHODS AND APPARATUS FOR DETECTING INTERNET CONNECTION PROBLEMS
						ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Dec 2, 2004		EPO	Pending	17170000.8		SYSTEM
Nov 2, 2010		EPO	Pending	17197764.8		DEVICE ABSTRACTION PROXY
Dec 5, 2011		EPO	Pending	18160805.0		SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Jul 13, 2012		EPO	Pending	18210562.7		METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK
Jan 30, 2019		EPO	Pending	19705639.3		SYSTEMS AND METHODS FOR BROADBAND COMMUNICATION LINK PERFORMANCE MONITORING
Aug 27, 2014		EPO	Pending	20177254.8		SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING PERSISTENT MANAGEMENT AGENT (PMA) FUNCTIONS FOR THE CONTROL AND COORDINATION OF DPU AND DSLAM COMPONENTS
Aug 27, 2014		LFO	renunig	20177254.8		SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011		EPO	Pending	201821162.5		MULTIPLE DISTINCT LAN NETWORKS
Mar 25, 2013		EPO	Pending	2013715545		METHOD AND APPARATUS FOR IMPLEMENTING WIRELESS SYSTEM DISCOVERY AND CONTROL USING A STATE-SPACE
May 30, 2014		EPO	Pending	2014893025		METHOD AND APPARATUS FOR IMPROVING BROADBAND EXPERIENCE USING CLOUD BASED RECOMMENDATION ENGINE
May 30, 2014		LIO	rending	2014033023		SYSTEMS AND METHODS FOR NET NEUTRALITY
Jan 24, 2019		EPO	Pending	EP19719973.0		TESTING
Oct 3, 2006		EPO	Pending	EP20177570.7		DSL SYSTEM
Oct 9, 2012		EPO	Pending	EP20177683.8		METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS
Oct 30, 2014		EPO	Pending	EP20194193.7		METHOD AND APPARATUS FOR PROVIDING PERFORMANCE AND USAGE INFORMATION FOR A WIRELESS LOCAL AREA NETWORK

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title
Dec 4, 2014		EPO	Pending	EP20194697.7		METHOD AND APPARATUS FOR PREDICTING SUCCESSFUL DSL LINE OPTIMIZATION
May 30, 2014		EPO	Pending	EP20194700.9		METHOD AND APPARATUS FOR GENERATING POLICIES FOR IMPROVING NETWORK SYSTEM PERFORMANCE
May 2, 2018		EPO	Published	18795224.7		SYSTEMS AND METHODS FOR IMPLEMENTING HIGH- SPEED WAVEGUIDE TRANSMISSION OVER WIRES
Dec 2, 2004	May 10, 2017	Finland	Issued	04801293.4	1721230	ADAPTIVE MARGIN AND BAND CONTROL
Mar 18, 2005	May 6, 2020	Finland	Issued	10182701.2	2278785	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
Dec 5, 2011	May 22, 2019	Finland	Issued	11802826.5	2789134	SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Mar 16, 2006	May 27, 2020	Finland	Issued	12179552.0	2549728	DSL SYSTEM TRAINING
Dec 2, 2004	May 10, 2017	France	Issued	04801293.4	1721230	ADAPTIVE MARGIN AND BAND CONTROL IN A DSL SYSTEM
Dec 2, 2004	10129 10, 2017	Trance	issucu	04001233.4	1,21230	SISTEM
Dec 2, 2004	Apr 28, 2010	France	Issued	04801294.2	1700410	ADAPTIVE FEC CODEWORD MANAGEMENT
Mar 18, 2005	Aug 3, 2011	France	Issued	05708773.6	1733550	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
May 18, 2005	Jan 4, 2012	France	Issued	05741016.9	1756963	Dynamic management of communication system
May 18, 2005	Jan 14, 2009	France	Issued	05747117.9	1757042	INCENTIVE-BASED DSL SYSTEM
Mar 16, 2006	May 8, 2019	France	Issued	06710580.9	1894401	DSL SYSTEM TRAINING
Mar 17, 2006	Sep 13, 2017	France	Issued	06727414.2	1911256	USER-PREFERENCE-BASED DSL SYSTEM
Mar 16, 2006	Jan 26, 2011	France	Issued	06744467.9	1894377	DSL SYSTEM LOADING AND ORDERING

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Date Filed - Priority Patent	Grant Date	Country	Ctat	A	n_1_1#	Title
ratent	Grant Date	Name	Status	Application #	Patent #	ritie
						DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE
Feb 28, 2006	May 23, 2012	France	Issued	06755837.9	1869790	PROFILE CONTROL
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Oct 3, 2006	Jul 8, 2020	France	Issued	06816102.5	1932076	DSL SYSTEM
		_				
Dec 2, 2004	May 13, 2015	France	Issued	10152127.6	2187558	ADAPTIVE FEC CODEWORD MANAGEMENT
Dec 2, 2004	Nov 9, 2011	France	Issued	10179600.1	2259495	ADAPTIVE MARGIN AND BAND CONTROL
DCC 2, 2001	1404 3, 2011	Trance	133424	10175000.1	2233133	ALD ALL THE MARKET AND BARE CONTINUE
Mar 18, 2005	May 6, 2020	France	Issued	10182701.2	2278785	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
N2 2010	1 10 2010	F	t	107052444	2407226	DELUCE A RETRACTION PROVV
Nov 2, 2010	Jan 10, 2018	France	Issued	10785244.4	2497226	DEVICE ABSTRACTION PROXY
Aug 10, 2005	Oct 4, 2017	France	Issued	12154413.4	2472729	INTERFERENCE CANCELLATION SYSTEM
						DYNAMIC DIGITAL COMMUNICATION SYSTEM
May 31, 2002	Dec 12, 2012	France	Issued	12167376.8	2533436	CONTROL
Mar 16, 2006	May 27, 2020	France	Issued	12179552.0	2549728	DSL SYSTEM TRAINING
	1114 277 2020		1000.00	1217333213	2010720	SOLOTOTE IN THE WITHING
						SYSTEM FOR DIAGNOSING AND OPTIMIZING
Mar 19, 2012	Jul 18, 2018	France	Issued	12711318.1	2828977	VECTORED DSL LINE
						ADDADATUS 6/675146 AND
May 7, 2012	Aug 21, 2019	France	Issued	12721143.1	2847914	APPARATUS, SYSTEMS AND METHODS FOR IMPULSE NOISE DETECTION AND MITIGATION
iviay 1, 2012	Aug 21, 2019	riance	issueu	12/21143.1	204/314	NOISE DETECTION AND WITTIGATION
						METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012	Jan 2, 2019	France	Issued	12743284.7	2873195	MEASUREMENT OF A COMMUNICATION LINK
						OPTIMIZED CONTROL SYSTEM FOR AGGREGATION
		_				OF MULTIPLE BROADBAND CONNECTIONS OVER
Sep 29, 2012	May 30, 2018	France	Issued	12773465	2901632	RADIO INTERFACES
						METHOD AND SYSTEM FOR CONNECTIVITY
Oct 9, 2012	Dec 27, 2017	France	Issued	12780966.3	2907269	DIAGNOSTICS IN COMMUNICATION SYSTEMS
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Aug 30, 2013	May 6, 2020	France	Issued	13763375.6	3039850	LOW POWER SYSTEM AND METHOD FOR DSL LINES

Date Filed - Priority		Country	a	a 1: .: #	<b>=</b>	
Patent	Grant Date	Name	Status	Application #	Patent #	Title
Dec 17, 2013	Mar 27, 2019	France	Issued	13821031.5	3114891	SYSTEMS METHODS AND APPARATUSES FOR IMPLEMENTING DISTRIBUTED WIRELESS DATA SHARING AND CONTROL SYSTEMS
Dec 5, 2011	Apr 18, 2018	France	Issued	117970970	2789133	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Aug 10, 2005	Jan 9, 2013	France	Issued	2005850646	1784923	INTERFERENCE CANCELLATION SYSTEM
Mar 17, 2006	May 31, 2017	France	Issued	2006727480	1897305	Tonal predictive GDFE
Jun 6, 2007	Aug 10, 2011	France	Issued	2007795837	EP200779583 7	VECTORED DSL SYSTEM
Jul 8, 2006	May 10, 2017	France	Issued	06786827/3	1905164	ADAPTIVE MARGIN AND BAND CONTROL
Jan 12, 2011	Apr 4, 2018	France	Issued	E11700879.7	2664103	SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING WAN AND LAN NETWORK COMMUNICATIONS
Oct 30, 2014		Franco	Pending	14905229.2		METHOD AND APPARATUS FOR PROVIDING PERFORMANCE AND USAGE INFORMATION FOR A
Oct 30, 2014		France	renaing	14903229.2		WIRELESS LOCAL AREA NETWORK
Dec 4, 2014		France	Pending	EP 14 907 600.2		METHOD AND APPARATUS FOR PREDICTING SUCCESSFUL DSL LINE OPTIMIZATION
Dog 3, 2004	Nov. 16, 2011	Commony	leaved	04901201.9	1700422	DHL SYSTEM ESTIMATION AND PARAMETER
Dec 2, 2004	Nov 16, 2011	Germany	Issued	04801291.8	1700423	RECOMMENDATION
Dec 2, 2004	May 10, 2017	Germany	Issued	04801293.4	60200405124 7.8	ADAPTIVE MARGIN AND BAND CONTROL IN A DSL SYSTEM
Dec 2, 2004	Apr 28, 2010	Germany	Issued	04801294.2	1700410	ADAPTIVE FEC CODEWORD MANAGEMENT
Mar 18, 2005	Aug 3, 2011	Germany	Issued	05708773.6	1733550	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
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May 18, 2005	Jan 4, 2012	Germany	Issued	05741016.9	1756963	Dynamic management of communication system
May 18, 2005	Jan 14, 2009	Germany	Issued	05747117.9	1757042	INCENTIVE-BASED DSL SYSTEM
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Date Field - Priority   Patent   Grant Date   Name   Status   Application #   Patent #   Title     Title
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Aug 10, 2005 Jan 9, 2013 Germany Issued 05850646.0 1784923 INTERFERENCE CANCELLATION SYSTEM  Feb 28, 2006 Feb 21, 2018 Germany Issued 06710503.1 9.0 PHANTOM USE IN DSL SYSTEMS  Mar 16, 2006 May 8, 2019 Germany Issued 06710580.9 4.4 DSL SYSTEM TRAINING  Mar 16, 2006 May 9, 2018 Germany Issued 06727405.0 1897306 TONAL PRECODING IN MULTI-USER VECTORED DSL TRANSMISSION  Mar 17, 2006 Sep 13, 2017 Germany Issued 06727414.2 1911256 USER-PREFERENCE-BASED DSL SYSTEM  Mar 16, 2006 Jan 26, 2011 Germany Issued 6744467.9 1894377 DSL SYSTEM LOADING AND ORDERING  Feb 28, 2006 May 23, 2012 Germany Issued 06755837.9 1869790 DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE Feb 28, 2006 May 23, 2012 Germany Issued 06816102.5 60 2006 059 S37.9 DSL SYSTEM  Oct 3, 2007 Mar 28, 2018 Germany Issued 07852551.6 60200705439 4.0 INTERFERENCE CANCELLATION SYSTEM  Dec 2, 2004 May 13, 2015 Germany Issued 10152127.6 2187558 ADAPTIVE FEC CODEWORD MANAGEMENT  ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
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Mar 16, 2006         May 8, 2019         Germany         Issued         06710580.9         60200605791 4.4         DSL SYSTEM TRAINING           Mar 16, 2006         May 9, 2018         Germany         Issued         06727405.0         1897306         TONAL PRECODING IN MULTI-USER VECTORED DSL TRANSMISSION           Mar 17, 2006         Sep 13, 2017         Germany         Issued         06727414.2         1911256         USER-PREFERENCE-BASED DSL SYSTEM           Mar 16, 2006         Jan 26, 2011         Germany         Issued         6744467.9         1894377         DSL SYSTEM LOADING AND ORDERING           Feb 28, 2006         May 23, 2012         Germany         Issued         06755837.9         1869790         DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL           Oct 3, 2006         Jul 8, 2020         Germany         Issued         06816102.5         60 2006 059 537.9         DSL SYSTEM           Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         60200705439 4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT
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Mar 16, 2006         May 8, 2019         Germany         Issued         06710580.9         4.4         DSL SYSTEM TRAINING           Mar 16, 2006         May 9, 2018         Germany         Issued         06727405.0         1897306         TONAL PRECODING IN MULTI-USER VECTORED DSL TRANSMISSION           Mar 17, 2006         Sep 13, 2017         Germany         Issued         06727414.2         1911256         USER-PREFERENCE-BASED DSL SYSTEM           Mar 16, 2006         Jan 26, 2011         Germany         Issued         6744467.9         1894377         DSL SYSTEM LOADING AND ORDERING           Feb 28, 2006         May 23, 2012         Germany         Issued         06755837.9         1869790         DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL           Oct 3, 2006         Jul 8, 2020         Germany         Issued         06816102.5         60 2006 059 537.9         DSL SYSTEM           Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         60200705439 4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT
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Mar 16, 2006         May 9, 2018         Germany         Issued         06727405.0         1897306         TRANSMISSION           Mar 17, 2006         Sep 13, 2017         Germany         Issued         06727414.2         1911256         USER-PREFERENCE-BASED DSL SYSTEM           Mar 16, 2006         Jan 26, 2011         Germany         Issued         6744467.9         1894377         DSL SYSTEM LOADING AND ORDERING           Feb 28, 2006         May 23, 2012         Germany         Issued         06755837.9         1869790         DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL           Oct 3, 2006         Jul 8, 2020         Germany         Issued         06816102.5         60 2006 059 537.9         DSL SYSTEM           Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT
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Mar 16, 2006         Jan 26, 2011         Germany         Issued         6744467.9         1894377         DSL SYSTEM LOADING AND ORDERING           Feb 28, 2006         May 23, 2012         Germany         Issued         06755837.9         1869790         DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL           Oct 3, 2006         Jul 8, 2020         Germany         Issued         06816102.5         60 2006 059 537.9         DSL SYSTEM           Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT
Feb 28, 2006         May 23, 2012         Germany         Issued         06755837.9         1869790         DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL           Oct 3, 2006         Jul 8, 2020         Germany         Issued         06816102.5         537.9         DSL SYSTEM           Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT           ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Feb 28, 2006   May 23, 2012   Germany   Issued   06755837.9   1869790   DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE   PROFILE CONTROL
Feb 28, 2006   May 23, 2012   Germany   Issued   06755837.9   1869790   DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE   PROFILE CONTROL
Feb 28, 2006   May 23, 2012   Germany   Issued   06755837.9   1869790   DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE   PROFILE CONTROL
Feb 28, 2006   May 23, 2012   Germany   Issued   O6755837.9   1869790   PROFILE CONTROL
Feb 28, 2006   May 23, 2012   Germany   Issued   O6755837.9   1869790   PROFILE CONTROL
Feb 28, 2006   May 23, 2012   Germany   Issued   O6755837.9   1869790   PROFILE CONTROL
Oct 3, 2006         Jul 8, 2020         Germany         Issued         06816102.5         537.9         DSL SYSTEM           Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT           ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Oct 3, 2006         Jul 8, 2020         Germany         Issued         06816102.5         537.9         DSL SYSTEM           Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         60200705439 4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT           ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Oct 3, 2006         Jul 8, 2020         Germany         Issued         06816102.5         537.9         DSL SYSTEM           Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         60200705439 4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT           ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         60200705439 4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT           ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT           ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT           ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Oct 5, 2007         Mar 28, 2018         Germany         Issued         07852551.6         4.0         INTERFERENCE CANCELLATION SYSTEM           Dec 2, 2004         May 13, 2015         Germany         Issued         10152127.6         2187558         ADAPTIVE FEC CODEWORD MANAGEMENT           ADAPTIVE MARGIN AND BAND CONTROL IN A DSL         ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Dec 2, 2004 May 13, 2015 Germany Issued 10152127.6 2187558 ADAPTIVE FEC CODEWORD MANAGEMENT  ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
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ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Dec 2, 2004 Nov 9, 2011 Germany Issued 10179600.1 2259495 SYSTEM
60200505680
Mar 18, 2005 May 6, 2020 Germany Issued 10182701.2 8.5 HIGH SPEED MULTIPLE LOOP DSL SYSTEM
mai 19, 2000   May 9, 2020   Germany   100000   100000   100000   100000   100000   100000   100000   100000   100000   100000   10000
60201004799
Nov 2, 2010 Jan 10, 2018 Germany Issued 10785244.4 5.1 DEVICE ABSTRACTION PROXY
60200705449
Jun 6, 2007         Apr 4, 2018         Germany         Issued         11161331.1         1.2         VECTORED DSL SYSTEM
Jun 6, 2007         Apr 4, 2018         Germany         Issued         11161331.1         1.2         VECTORED DSL SYSTEM
Jun 6, 2007         Apr 4, 2018         Germany         Issued         11161331.1         1.2         VECTORED DSL SYSTEM
Jun 6, 2007         Apr 4, 2018         Germany         Issued         11161331.1         1.2         VECTORED DSL SYSTEM           Jan 12, 2011         Apr 4, 2018         Germany         Issued         11700879.7         2664103         WAN AND LAN NETWORK COMMUNICATIONS

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent#	Title
Dec 5, 2011	May 22, 2019	Germany	Issued	11802826.5	60201105922 9.7	SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
,	, ,	,				
May 31, 2002	Dec 12, 2012	Germany	Issued	12167376.8	2533436	DYNAMIC DIGITAL COMMUNICATION SYSTEM CONTROL
Mar 16, 2006	May 27, 2020	Germany	Issued	12179552.0	60200605943 8.0	DSL SYSTEM TRAINING
Nov 2, 2010	Apr 11, 2018	Germany	Issued	12189530.4	60201004993 2.4	DEVICE ABSTRACTION PROXY
Mar 19, 2012	Jul 18, 2018	Germany	Issued	12711318.1	2828977	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINE
Apr 13, 2012	Feb 21, 2018	Germany	Issued	12717538.8	60201204301 2.5	DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS
Oct 9, 2012	Dec 27, 2017	Germany	Issued	12780966.3	60201204140 4.9	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS
Apr 23, 2013	Jun 6, 2018	Germany	Issued	13721852.5	60201303854 8.3	METHODS SYSTEMS, AND APPARATUSES FOR IMPLEMENTING UPSTREAM POWER CONTROL FOR DSL
	,	,				
Aug 30, 2013	May 6, 2020	Germany	Issued	13763375.6	3039850	LOW POWER SYSTEM AND METHOD FOR DSL LINES
Dec 17, 2013	Mar 27, 2019	Germany	Issued	13821031.5	3114891	SYSTEMS METHODS AND APPARATUSES FOR IMPLEMENTING DISTRIBUTED WIRELESS DATA SHARING AND CONTROL SYSTEMS
		-				
Mar 16, 2006	Jan 17, 2018	Germany	Issued	67446302		SELF-LEARNING AND SELF-ADJUSTING DSL SYSTEM
Mar 4, 2009	Jul 24, 2019	Germany	Issued	097894950	60200905923 8.6	DSL NOISE CANCELLATION USING SUB-OPTIMAL NOISE REFERENCE SIGNALS
,	52. 2 i, 2315			32,23,330	5.5	3131716
Dec 5, 2011	Apr 18, 2018	Germany	Issued	117970970	60201104763 1.9	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Sep 29, 2012	May 30, 2018	Germany	Issued	127734655	60201204694 12	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES
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Jul 8, 2006	Jul 25, 2017	Germany	lssued	2006786827	60200605251 3.3	ADAPTIVE MARGIN AND BAND CONTROL
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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent#	Title
lun 6, 2007	Aug 10, 2011	Cormony	lecued	2007795837	EP200779583	VECTORED DEL CYCTEM
Jun 6, 2007	Aug 10, 2011	Germany	Issued	2007/95837	7	VECTORED DSL SYSTEM
					60201206312	APPARATUS, SYSTEMS AND METHODS FOR IMPULSE
May 7, 2012	Aug 21, 2019	Germany	Issued	2012721143	7.9	NOISE DETECTION AND MITIGATION
				602005052865.		
Aug 10, 2005	Oct 4, 2017	Germany	Issued	2	2472729	INTERFERENCE CANCELLATION SYSTEM
,		,				
				602006052676.	60200605267	T.   1111 ODES
Mar 17, 2006	May 31, 2017	Germany	Issued	8	6.8	Tonal predictive GDFE
				602007052746.	60200705274	METHOD AND APPARATUS FOR ANALYZING AND
Jul 31, 2007	Oct 18, 2017	Germany	Issued	5	6.5	MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE
						NOV. IN CASH C DIA CHOCTIC TO A MCCION AND
May 10, 2010	Sep 5, 2018	Germany	Issued	60 2010 053 301.8	2569929	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING
Widy 10, 2010	3ср 3, 2010	Germany	issucu	301.0	2303323	TESTING
					60200906136	METHOD AND APPARATUS FOR DSL PERFORMANCE
Jul 1, 2009	Mar 4, 2020	Germany	Issued	EP 09790028.6	3.4	ENHANCEMENT IN A DSL NETWORK
						METHOD AND APPARATUS FOR PREDICTING
Dec 4, 2014		Germany	Pending	14907600.2		SUCCESSFUL DSL LINE OPTIMIZATION
·		,	-			
						METHOD AND APPARATUS FOR PROVIDING
0+20 2014		C	Dandina	ED 14 00E 220 2		PERFORMANCE AND USAGE INFORMATION FOR A
Oct 30, 2014		Germany	Pending	EP 14 905 229.2		WIRELESS LOCAL AREA NETWORK
						SYSTEMS AND METHODS FOR IMPLEMENTING HIGH-
May 2, 2018		India	Pending	201927033783		SPEED WAVEGUIDE TRANSMISSION OVER WIRES
						CVCTENAC AND NACTUODS FOR TRAFFIC LOAD
				1113MUMNP2		SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011		India	Pending	014		MULTIPLE DISTINCT LAN NETWORKS
						METHOD AND SYSTEM FOR USING A
Son 25, 2012		India	Donding	418/CHENP/20		DOWNLOADABLE AGENT FOR A COMMUNICATION
Sep 25, 2012		India	Pending	15		SYSTEM, DEVICE, OR LINK
						SYSTEMS AND METHODS FOR TRAFFIC
				4205CHENP201		AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011		India	Pending	4		MULTIPLE DISTINCT LAN NETWORKS
				4985CHENP201		SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING
Jan 12, 2011		India	Pending	3		WAN AND LAN NETWORK COMMUNICATIONS
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Oat 0, 2012		المطائم	Dond:	992MUMNP20		METHOD AND SYSTEM FOR LATENCY MEASUREMENT
Oct 9, 2012		India	Pending	15		IN COMMUNICATION SYSTEMS

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title
Dec 2, 2004	Nov 16, 2011	Italy	Issued	04801291.8	1700423	DHL SYSTEM ESTIMATION AND PARAMETER RECOMMENDATION
Dec 2, 2004	Apr 28, 2010	Italy	Issued	04801294.2	1700410	ADAPTIVE FEC CODEWORD MANAGEMENT
Mar 18, 2005	Aug 2, 2018	Italy	Issued	05708773.6	83201800000 08493	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
May 18, 2005	Jan 4, 2012	Italy	Issued	05741016.9	1756963	Dynamic management of communication system
Feb 28, 2006	May 23, 2012	Italy	Issued	06755837.9	1869790	DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL
Dec 2, 2004	May 13, 2015	Italy	Issued	10152127.6	2187558	ADAPTIVE FEC CODEWORD MANAGEMENT
Dec 2, 2004	Nov 9, 2011	Italy	Issued	10179600.1	2259495	ADAPTIVE MARGIN AND BAND CONTROL IN A DSL SYSTEM
Mar 18, 2005	May 6, 2020	Italy	Issued	10182701.2	2278785	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
May 31, 2002	Dec 12, 2012	Italy	Issued	12167376.8	2533436	DYNAMIC DIGITAL COMMUNICATION SYSTEM CONTROL
Mar 16, 2006	May 27, 2020	Italy	Issued	12179552.0	50202000007 5628	DSL SYSTEM TRAINING
May 7, 2012	Aug 21, 2019	Italy	Issued	12721143.1	50201900009 5256	APPARATUS, SYSTEMS AND METHODS FOR IMPULSE NOISE DETECTION AND MITIGATION
Dec 17, 2013	Mar 27, 2019	Italy	Issued	13821031.5	3114891	SYSTEMS METHODS AND APPARATUSES FOR IMPLEMENTING DISTRIBUTED WIRELESS DATA SHARING AND CONTROL SYSTEMS
Aug 10, 2005	Jan 9, 2013	Italy	Issued	2005850646	1784923	
				502020000063		INTERFERENCE CANCELLATION SYSTEM
Aug 30, 2013  Dec 2, 2004	May 6, 2020  Dec 22, 2011	Italy Japan	Issued Issued	2006542048	3039850 4891779	ADAPTIVE MARGIN AND BAND CONTROL IN A DSL SYSTEM

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent#	Title
Dec 2, 2004	Apr 8, 2011	lanan	Issued	2006542049	4718479	ADAPTIVE FEC CODEWORD MANAGEMENT
Dec 2, 2004	Apr 8, 2011	Japan	issueu	2006342049	4/104/9	ADAPTIVE FEE CODEWORD MANAGEMENT
May 18, 2005	Aug 10, 2012	Japan	Issued	2007517505	5057971	Dynamic management of communication system
May 18, 2005	Dec 3, 2010	Japan	Issued	2007517506	4637177	INCENTIVE-BASED DSL SYSTEM
A = 40, 2005	L.127.2042		tana d	2007526500	5040702	INTERESTRACE CANCELLATION OVETEN
Aug 10, 2005	Jul 27, 2012	Japan	Issued	2007526598	5049783	INTERFERENCE CANCELLATION SYSTEM
						DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE
Feb 28, 2006	Jan 27, 2012	Japan	Issued	2007557625	4913758	PROFILE CONTROL
Feb 28, 2006	Feb 3, 2012	Japan	Issued	2008510655	4918087	PHANTOM USE IN DSL SYSTEMS
	_ · - · - <b>,</b>					
Mar 16, 2006	Mar 8, 2013	Japan	Issued	2008514211	5216581	DSL SYSTEM TRAINING
Mar 17, 2006	Dec 22, 2011	Japan	Issued	2008514213	4891992	Tonal predictive GDFE
Mar 16, 2006	Sep 13, 2013	Japan	Issued	2008514214	5364370	SELF-LEARNING AND SELF-ADJUSTING DSL SYSTEM
Wiai 10, 2000	Зер 13, 2013	зарап	issueu	2000314214	3304370	SELI-LEANING AND SELI-ADDOSTING DSE STSTEM
						Operator-controlled user-preference-based xDSL
Mar 16, 2006	Feb 17, 2012	Japan	Issued	2008515302	4928545	system
Mar 16, 2006	Jan 18, 2013	Japan	Issued	2008515303	5180069	DSL SYSTEM LOADING AND ORDERING
M 17 2006	F-1- 17 2012	1	lance of	2000515204	4020546	LICED DEFENDACE DACED DCL CVCTEM
Mar 17, 2006	Feb 17, 2012	Japan	Issued	2008515304	4928546	USER-PREFERENCE-BASED DSL SYSTEM
Mar 16, 2006	Dec 21, 2012	Japan	Issued	2008517616	5162455	DYNAMIC MINIMUM-MEMORY INTERLEAVING
Jul 8, 2006	Dec 22, 2011	Japan	Issued	2008521505	4891995	DSL SYSTEM
Jul 8, 2006	Feb 10, 2012	Japan	Issued	2008521506	4921468	ADAPTIVE MARGIN AND BAND CONTROL

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent#	Title
Oct 3, 2006	Apr 27, 2012	Japan	Issued	2008534622	4980362	DSL SYSTEM
		·				
Ann 27, 2007	F-1- 20, 2014	1	lanca d	2000500000	5400000	METHODS AND APPARATUS TO PERFORM LINE
Apr 27, 2007	Feb 28, 2014	Japan	Issued	2009509980	5486923	TESTING AT CUSTOMER PREMISES
Jun 6, 2007	Feb 22, 2013	Japan	Issued	2009514370	5203359	DSL SYSTEM
Jul 31, 2007	Jan 18, 2013	Japan	Issued	2009522833	5179495	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE
0+5 2007	A12 2012	lana.	lance d	2000521465	F2.42F70	INTEREDENCE CANCELLATION OVETEN
Oct 5, 2007	Apr 12, 2013	Japan	Issued	2009531465	5242578	INTERFERENCE CANCELLATION SYSTEM
Dec 7, 2007	Jul 19, 2013	Japan	Issued	2009540324	5319544	DSL RING SIGNAL COMPATIBILITY
Feb 19, 2010	Sep 19, 2014	Japan	Issued	2011554065	5615850	METHOD AND APPARATUS FOR REDUCING NOISE IN A COMMUNICATION SYSTEM
N2 2010	M12 2015	1	lanca d	2012527054	F710626	DELUCE ARCTRACTION PROVI
Nov 2, 2010	Mar 13, 2015	Japan	Issued	2012537954	5710636	DEVICE ABSTRACTION PROXY
						TONAL PRECODING IN MULTI-USER VECTORED DSL
Mar 16, 2006	Oct 31, 2014	Japan	Issued	2013081528	5638653	TRANSMISSION
May 10, 2010	Oct 17, 2014	Japan	Issued	2013510053	5632535	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING
Don 20, 2010	Oat 2, 2015	lanan	leaved	2012547446	F01420F	MANAGEMENT CENTER FOR COMMUNICATION
Dec 30, 2010	Oct 2, 2015	Japan	Issued	2013547446	5814385	SYSTEM CUSTOMER PREMISES EQUIPMENT
						OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER
Sep 29, 2012	Jul 29, 2016	Japan	Issued	2015534448	5974226	RADIO INTERFACES
Dec 28, 2010	Oct 4, 2013	Japan	Issued	2010-292642	5380427	ADAPTIVE FEC CODEWORD MANAGEMENT
In 8 2005	Nov. 1, 2012	lans:	المعددة الم	2011 055704	E404404	DELEVETEM
Jul 8, 2006	Nov 1, 2013	Japan	Issued	2011-055791	5401494	DSL SYSTEM
						DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE
Feb 28, 2006	Nov 22, 2013	Japan	Issued	2011-255444	5417415	PROFILE CONTROL

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Date Filed - Priority Patent	Grant Date	Country Name	Status	Application#	Patent#	Title
						METHOD AND APPARATUS FOR DSL PERFORMANCE
Jul 1, 2009	Sep 12, 2014	Japan	Issued	2012-518520	5612089	ENHANCEMENT IN A DSL NETWORK
						SYSTEMS AND METHODS FOR TRAFFIC
Dec 5, 2011	May 22, 2019	Lithuania	Issued	11802826.5	2789134	AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
				MX/a/2020/00		SYSTEMS AND METHODS FOR BROADBAND COMMUNICATION LINK PERFORMANCE
Jan 30, 2019		Mexico	Pending	8077		MONITORING
lon 24, 2010		Mayisa	Donding	MX/a/2020/00 8078		SYSTEMS AND METHODS FOR NET NEUTRALITY
Jan 24, 2019		Mexico	Pending	8078		TESTING
		Netherland				DHL SYSTEM ESTIMATION AND PARAMETER
Dec 2, 2004	Nov 16, 2011	S	Issued	04801291.8	1700423	RECOMMENDATION
5 0 0004		Netherland			4704000	
Dec 2, 2004	May 10, 2017	S	Issued	04801293.4	1721230	ADAPTIVE MARGIN AND BAND CONTROL
		Nathaulau d				
Dec 2, 2004	Apr 28, 2010	Netherland s	Issued	04801294.2	1700410	ADAPTIVE FEC CODEWORD MANAGEMENT
		Netherland				
Mar 18, 2005	Aug 3, 2011	S	Issued	05708773.6	1733550	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
May 18, 2005	Jan 4, 2012	Netherland s	Issued	05741016.9	1756963	Dynamic management of communication system
		Netherland				
Feb 28, 2006	Feb 21, 2018	S	Issued	06710503.1	1880503	PHANTOM USE IN DSL SYSTEMS
Mar 16, 2006	May 9, 2018	Netherland s	Issued	06727405.0	1897306	TONAL PRECODING IN MULTI-USER VECTORED DSL TRANSMISSION
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		Netherland				
Mar 17, 2006	Sep 13, 2017	S	Issued	06727414.2	1911256	USER-PREFERENCE-BASED DSL SYSTEM
Feb 28, 2006	May 23, 2012	Netherland s	Issued	06755837.9		DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL
	, 20, 2012		.55 56			
		Netherland			60 2006 059	
Oct 3, 2006	Jul 8, 2020	S	Issued	06816102.5	537.9	DSL SYSTEM
Iul 21, 2007	Oct 10 2017	Netherland	lectrod	07010021 1	2055096	METHOD AND APPARATUS FOR ANALYZING AND
Jul 31, 2007	Oct 18, 2017	S	Issued	07810931.1	2055086	MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE

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May 22, 2004   May 13, 2015   Netherland   Issued   107852551.6   2076972   INTERPRENCE CANCELLATION SYSTEM							
May 22, 2004   May 13, 2015   Netherland   Issued   107852551.6   2076972   INTERPRENCE CANCELLATION SYSTEM	Data Fillad Balasika		C				
Dec 2, 2004   May 13, 2013   Netherland   Issued   107852531.6   20768722   INTERFERENCE CANCELLATION SYSTEM		Crant Data		Chabus	Annlientian #	Mataut #	Tielo
Dec 2, 2004   May 13, 2015   Several   Sever	ratent	Grant Date	ivanie	Status	Application #	ratenta	TOE
Dec 2, 2004   May 13, 2015   Netherland   Issued   10152127.6   2187558   ADAPTIVE FEC CODEWORD MANAGEMENT							
Dec 2, 2004   May 13, 2015   Netherland   Sued   10152127.6   2187558   ADAPTIVE FEC CODEWORD MANAGEMENT			Netherland				
Dec 2, 2004   May 13, 2015   S   Issued   10152127.6   2187358   ADAPTIVE FIEC CODEWORD MANAGEMENT	Oct 5, 2007	Mar 28, 2018	l	Issued	07852551.6	2076972	INTERFERENCE CANCELLATION SYSTEM
Dec 2, 2004   May 13, 2015   S   Issued   10152127.6   2187358   ADAPTIVE FIEC CODEWORD MANAGEMENT		·					
Dec 2, 2004   May 13, 2015   S   Issued   10152127.6   2187358   ADAPTIVE FIEC CODEWORD MANAGEMENT							
Netherland   Netherland   Sueed   10179600.1   2259495   SYSTEM   ADAPTIVE MARGIN AND BAND CONTROL IN A DSL SYSTEM   Netherland   Sueed   10785244.4   2497226   DEVICE ABSTRACTION PROXY			Netherland				
Dec 2, 2004   Nov 9, 2011   s   Issued   1079600.1   2259495   SYSTEM	Dec 2, 2004	May 13, 2015	S	Issued	10152127.6	2187558	ADAPTIVE FEC CODEWORD MANAGEMENT
Dec 2, 2004   Nov 9, 2011   s   Issued   10785041.4   2259495   SYSTEM							
Dec 2, 2004   Nov 9, 2011   s   Issued   10785041.4   2259495   SYSTEM							
Nov 2, 2010	D 0 0004		l		101705001	2250405	
Note   Note   Note   Netherland   Sevent   Sevent   Netherland	Dec 2, 2004	NOV 9, 2011	S	issuea	10179600.1	2259495	SYSTEM
Note   Note   Note   Note   Netherland   Sevential   Netherland   Sevential   Note   Netherland   Note   Netherland   Sevential   Netherland   Net							
Note   Note   Note   Note   Netherland   Sevential   Netherland   Sevential   Note   Netherland   Note   Netherland   Sevential   Netherland   Net			Notherland				
Jun 6, 2007   Apr 4, 2018   Netherland   Susued   11161331.1   2337371   VECTORED DSL SYSTEM	Nov 2 2010	lan 10, 2018	l	Issued	10785244 4	2497226	DEVICE ABSTRACTION PROXY
Jun 6, 2007   Apr 4, 2018   S   Issued   1161331.1   2337371   VECTORED DSL SYSTEM	1107 2, 2010	3411 10, 2010	3	133424	10703211.1	2137220	DEVICE ABOTT NOTION THOSE
Jun 6, 2007   Apr 4, 2018   S   Issued   1161331.1   2337371   VECTORED DSL SYSTEM							
Dec 5, 2011			Netherland				
Netherland   Sep 29, 2012	Jun 6, 2007	Apr 4, 2018	s	Issued	11161331.1	2337371	VECTORED DSL SYSTEM
Netherland   Sep 29, 2012							
Dec 5, 2011							SYSTEMS AND METHODS FOR TRAFFIC
Aug 10, 2005 Oct 4, 2017 Sheriand susued 12154413.4 2472729 INTERFERENCE CANCELLATION SYSTEM  May 31, 2002 Dec 12, 2012 Sheriand susued 12167376.8 2533436 CONTROL  May 31, 2002 Dec 12, 2012 Sheriand susued 12167376.8 2533436 CONTROL  May 31, 2006 May 27, 2020 Sheriand susued 12179552.0 2549728 DSL SYSTEM TRAINING  Nov 2, 2010 Apr 11, 2018 Sheriand susued 12189530.4 2602958 DEVICE ABSTRACTION PROXY  Mar 19, 2012 Jul 18, 2018 Sheriand susued 12711318.1 2828977 VECTORED DSL LINE  Netherland Sheriand susued 12711318.1 2828977 DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS  Jul 13, 2012 Jan 2, 2019 Sheriand susued 12743284.7 2873195 METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK  Netherland Susued 12773465 2901632 RADIO INTERFACES  Netherland Susued 12773465 2901632 RADIO INTERFACES  Netherland Susued 12773465 2901632 RADIO INTERFACES			Netherland				AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Aug 10, 2005 Oct 4, 2017 s Issued 12154413.4 2472729 INTERFERENCE CANCELLATION SYSTEM  May 31, 2002 Dec 12, 2012 s Issued 12167376.8 2533436 DYNAMIC DIGITAL COMMUNICATION SYSTEM CONTROL  May 17, 2020 S Issued 12179552.0 2549728 DSL SYSTEM TRAINING  Netherland s Issued 12189530.4 2602958 DEVICE ABSTRACTION PROXY  Mar 19, 2012 Jul 18, 2018 S Issued 12711318.1 2828977 VECTORED DSL LINE  Netherland s Issued 12717538.8 2837168 DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS  Jul 13, 2012 Jan 2, 2019 S Issued 12743284.7 2873195 METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK  Sep 29, 2012 May 30, 2018 S Issued 12773465 2901632 RADIO INTERFACES  METHOD AND SYSTEM FOR CONNECTIVITY	Dec 5, 2011	May 22, 2019	S	Issued	11802826.5	2789134	MULTIPLE DISTINCT LAN NETWORKS
Aug 10, 2005 Oct 4, 2017 s Issued 12154413.4 2472729 INTERFERENCE CANCELLATION SYSTEM  May 31, 2002 Dec 12, 2012 s Issued 12167376.8 2533436 DYNAMIC DIGITAL COMMUNICATION SYSTEM CONTROL  May 17, 2020 S Issued 12179552.0 2549728 DSL SYSTEM TRAINING  Netherland s Issued 12189530.4 2602958 DEVICE ABSTRACTION PROXY  Mar 19, 2012 Jul 18, 2018 S Issued 12711318.1 2828977 VECTORED DSL LINE  Netherland s Issued 12717538.8 2837168 DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS  Jul 13, 2012 Jan 2, 2019 S Issued 12743284.7 2873195 METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK  Sep 29, 2012 May 30, 2018 S Issued 12773465 2901632 RADIO INTERFACES  Netherland s Issued 12773465 2901632 RADIO INTERFACES  METHOD AND SYSTEM FOR CONNECTIVITY							
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Netherland   Sep 29, 2012   May 30, 2018   Netherland   Sep 29, 2012   May 30, 2018   Netherland   Sep 29, 2012	Aug 10, 2005	Oct 4 2017	l	Issued	121544124	2472720	INTEDEEDENICE CANICELLATION SYSTEM
May 31, 2002   Dec 12, 2012   S   Issued   12167376.8   2533436   CONTROL	Aug 10, 2003	Oct 4, 2017	3	1330.00	12134413.4	2472723	INTERCEDICE CANCELLATION STSTEM
May 31, 2002   Dec 12, 2012   S   Issued   12167376.8   2533436   CONTROL							
May 31, 2002   Dec 12, 2012   S   Issued   12167376.8   2533436   CONTROL			Netherland				DYNAMIC DIGITAL COMMUNICATION SYSTEM
May 27, 2020   S   Issued   12179552.0   2549728   DSL SYSTEM TRAINING	May 31, 2002	Dec 12, 2012	s	Issued	12167376.8	2533436	
May 27, 2020   S   Issued   12179552.0   2549728   DSL SYSTEM TRAINING							
May 27, 2020   S   Issued   12179552.0   2549728   DSL SYSTEM TRAINING							
Nov 2, 2010			Netherland				
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Nov 2, 2010  Apr 11, 2018 s Issued 12189530.4 2602958 DEVICE ABSTRACTION PROXY  Netherland s Issued 12711318.1 2828977 VECTORED DSL LINE  DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS  Jul 13, 2012 Feb 21, 2018 s Issued 12717538.8 2837168 DISTRIBUTION ANALYSIS  Netherland s Issued 12743284.7 2873195 METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK  Sep 29, 2012 May 30, 2018 s Issued 12773465 2901632 METHOD AND SYSTEM FOR CONNECTIVITY							
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Mar 19, 2012  Jul 18, 2018  S  Issued  12711318.1  2828977  VECTORED DSL LINE  DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS  DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS  METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK  Sep 29, 2012  May 30, 2018  Netherland	NOV 2, 2010	Apr 11, 2018	5	issueu	12169550.4	2002938	DEVICE ABSTRACTION PROXY
Mar 19, 2012  Jul 18, 2018  S  Issued  12711318.1  2828977  VECTORED DSL LINE  DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS  DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS  METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK  OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES  Netherland							
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Apr 13, 2012  Feb 21, 2018  Netherland s  Issued  12717538.8  2837168  DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS  METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK  OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES  Netherland	Mar 19, 2012	Jul 18, 2018	l	Issued	12711318.1	2828977	
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Apr 13, 2012  Feb 21, 2018  S  Issued  12717538.8  2837168  DISTRIBUTION ANALYSIS  METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK  OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES  Netherland Netherland Netherland Netherland Netherland Netherland Netherland							DIAGNOSTIC METHODS FOR TWISTED PAIR
Jul 13, 2012  Netherland s Issued 12743284.7 2873195  METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK  OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES  Netherland  Netherland  Netherland  Netherland  Netherland			Netherland				TELEPHONE LINES BASED ON LINE DATA
Jul 13, 2012 Jan 2, 2019 s Issued 12743284.7 2873195 MEASUREMENT OF A COMMUNICATION LINK  OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES  Netherland Netherland System For Connectivity	Apr 13, 2012	Feb 21, 2018	S	Issued	12717538.8	2837168	DISTRIBUTION ANALYSIS
Jul 13, 2012 Jan 2, 2019 s Issued 12743284.7 2873195 MEASUREMENT OF A COMMUNICATION LINK  OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES  Netherland Netherland System For Connectivity							
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Sep 29, 2012 May 30, 2018 S Issued 12773465 2901632 OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES  Netherland Netherland METHOD AND SYSTEM FOR CONNECTIVITY	Jul 15, 2012	Jan 2, 2019	5	issued	12/43284./	20/3193	IVIEASUREIVIENT OF A COIVIIVIUNICATION LINK
Sep 29, 2012 May 30, 2018 S Issued 12773465 2901632 OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES  Netherland Netherland METHOD AND SYSTEM FOR CONNECTIVITY							ODTIMIZED CONTROL SYSTEM FOR ACCRECATION
Sep 29, 2012         May 30, 2018         s         Issued         12773465         2901632         RADIO INTERFACES           Netherland         Netherland         METHOD AND SYSTEM FOR CONNECTIVITY			Netherland				
Netherland METHOD AND SYSTEM FOR CONNECTIVITY	Sep 29, 2012	May 30. 2018	l	Issued	12773465	2901632	
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Oct 9, 2012         Dec 27, 2017         s         Issued         12780966.3         2907269         DIAGNOSTICS IN COMMUNICATION SYSTEMS			Netherland				METHOD AND SYSTEM FOR CONNECTIVITY
	Oct 9, 2012	Dec 27, 2017	S	Issued	12780966.3	2907269	DIAGNOSTICS IN COMMUNICATION SYSTEMS

Date Filed - Priority Patent	Grant Date	Country Name	Status	Application#	Patent#	Title
Apr 23, 2013	Jun 6, 2018	Netherland s	Issued	13721852	2907269	METHODS SYSTEMS, AND APPARATUSES FOR IMPLEMENTING UPSTREAM POWER CONTROL FOR DSL
Aug 30, 2013	May 6, 2020	Netherland s	Issued	13763375.6	3020138	LOW POWER SYSTEM AND METHOD FOR DSL LINES
Dec 17, 2013	Mar 27, 2019	Netherland s	Issued	13821031.5	3039850	SYSTEMS METHODS AND APPARATUSES FOR IMPLEMENTING DISTRIBUTED WIRELESS DATA SHARING AND CONTROL SYSTEMS
Mar 16, 2006	Jan 17, 2018	Netherland s	Issued	067446302	3114891	SELF-LEARNING AND SELF-ADJUSTING DSL SYSTEM
Dec 5, 2011	Apr 18, 2018	Netherland s	Issued	117970970	2789133	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Aug 10, 2005	Jan 9, 2013	Netherland s	Issued	2005850646	1784923	INTERFERENCE CANCELLATION SYSTEM
7.0g 10, 2003	3411 3, 2013	Netherland Netherland	issucu	2003030040	1704323	THE REAL OWNER DATE OF THE PROPERTY OF THE PRO
Mar 17, 2006	May 31, 2017	S	Issued	2006727480	1897305	Tonal predictive GDFE
Jul 8, 2006	Jun 2, 2017	Netherland s	Issued	2006786827	1905164	ADAPTIVE MARGIN AND BAND CONTROL
Mar 18, 2005	May 6, 2020	Netherland s	Issued	EP10182701.2	2278785	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
Jan 24, 2019		РСТ	Pending	PCT/US19/1496 2		SYSTEMS AND METHODS FOR NET NEUTRALITY TESTING
Oct 1, 2019		PCT	Pending	PCT/US19/5413 5		CONTENT DISTRIBUTION NETWORK CONTROL BASED ON NETWORK MEASUREMENT DATA
Feb 27, 2020		PCT	Pending	PCT/US20/2024 2		SYSTEMS AND METHODS FOR ERGODIC SPECTRUM MANAGEMENT
Jun 14, 2020		PCT	Pending	PCT/US20/3765		SYSTEMS AND METHODS FOR COMBINED MANAGEMENT WITH USER PREFERENCES OF WI-FI AND CELLULAR DATA
Sep 25, 2020		PCT	Pending	PCT/US20/5292 8		WIRELESS-WIRELINE PHYSICALLY CONVERGED ARCHITECTURES
Jan 30, 2019		РСТ	Pending	PCTUS1915837		SYSTEMS AND METHODS FOR BROADBAND COMMUNICATION LINK PERFORMANCE MONITORING

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent #	Title
Dec 10, 2019		РСТ	Published	PCT/US19/6556 0		SERVICE TYPE IDENTIFICATION SYSTEMS AND METHODS FOR OPTIMIZING LOCAL AREA NETWORKS
Mar 6, 2020		РСТ	Published	PCT/US20/2151 5		CONSTRAINED OPTIMIZATION OF WIRELESS LINKS IN NETWORKS WITH COMPETING OBJECTIVES
Jun 27, 2019		РСТ	Published	PCT/US2019/03 9603		SYSTEMS AND METHODS FOR CHAINING CONTROL- PLANE VIRTUAL FUNCTIONS FOR ENSURING END-TO- END QUALITY OF SERVICE (QOS) OF INTERNET SERVICES
Jul 13, 2012		Republic of Korea	Allowed	102015700363 4		METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK
Aug 27, 2014		Republic of Korea	Allowed	102017100781 2		SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING THE VIRTUALIZATION OF ACCESS NODE FUNCTIONS
Jul 13, 2012		Republic of Korea	Allowed	102018703381 7		METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK
Nov 28, 2019	Nov 18, 2020	Republic of Korea	Allowed	10-2019- 7035220		SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING THE VIRTUALIZATION OF ACCESS NODE FUNCTIONS
Jul 13, 2012	Nov 11, 2016	Republic of Korea	Issued	102015700217 8	1677404	METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK
Sep 29, 2012	Mar 16, 2017	Republic of Korea	Issued	102015700919 9	10-1719078	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES
Oct 9, 2012	Mar 18, 2016	Republic of Korea	Issued	102015701164 4	160632	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS
Jan 24, 2014	Aug 14, 2017	Republic of Korea	Issued	102015702242 6	10-1770050	METHOD AND APPARATUS FOR CLOUD SERVICES FOR ENHANCING BROADBAND EXPERIENCE
Mar 25, 2013	May 21, 2018	Republic of Korea	Issued	102015703203 8	101861908	METHOD AND APPARATUS FOR IMPLEMENTING WIRELESS SYSTEM DISCOVERY AND CONTROL USING A STATE-SPACE
Jul 13, 2012	Oct 27, 2017	Republic of Korea	Issued	102017700008 3	101793413	METHOD AND SYSTEM FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK
Oct 9, 2012	Jul 13, 2017	Republic of Korea	Issued	102017700656 3	10-1759860	METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS
Oct 30, 2014	Aug 17, 2018	Republic of Korea	Issued	102017700695 4	10-1891451	METHOD AND APPARATUS FOR PROVIDING PERFORMANCE AND USAGE INFORMATION FOR A WIRELESS LOCAL AREA NETWORK

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent #	Title
						SYSTEMS, METHODS, AND APPARATUSES FOR
						IMPLEMENTING PERSISTENT MANAGEMENT AGENT
		Republic of		102017700767		(PMA) FUNCTIONS FOR THE CONTROL AND
Aug 27, 2014	Mar 26, 2020	Korea	Issued	7	10-2095919	COORDINATION OF DPU AND DSLAM COMPONENTS
						MANAGEMENT SYSTEM AND METHODS OF
O+ 12 2012	I 10 2017	Republic of	laavaad	102017700903	10 1750467	MANAGING TIME-DIVISION DUPLEX (TDD)
Oct 12, 2012	Jul 12, 2017	Korea	Issued	8	10-1759467	TRANSMISSION OVER COPPER
		Republic of		10-2019-		METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012	Aug 11, 2020	Korea	Issued	7032227	10-2145360	MEASUREMENT OF A COMMUNICATION LINK
						METHOD AND SYSTEM FOR USING A
		Republic of		102015700263		DOWNLOADABLE AGENT FOR A COMMUNICATION
Sep 25, 2012		Korea	Pending	6		SYSTEM, DEVICE, OR LINK
		Republic of		10-2018-		METHODS AND APPARATUS FOR DETECTING
Mar 27, 2018		Korea	Pending	7008197		INTERNET CONNECTION PROBLEMS
				, , , , , , , , , , , , , , , , , , , ,		
		Republic of		10-2019-		SYSTEMS AND METHODS FOR IMPLEMENTING HIGH-
May 2, 2018		Korea	Pending	7026780		SPEED WAVEGUIDE TRANSMISSION OVER WIRES
						SYSTEMS, METHODS, AND APPARATUSES FOR
		D 11: 6		40.0000		IMPLEMENTING PERSISTENT MANAGEMENT AGENT
Aug 27, 2014		Republic of Korea	Donding	10-2020- 7008770		(PMA) FUNCTIONS FOR THE CONTROL AND
Aug 27, 2014		Korea	Pending	7008770		COORDINATION OF DPU AND DSLAM COMPONENTS
		Republic of		10-2020-		SYSTEMS AND METHODS FOR NET NEUTRALITY
Jan 24, 2019		Korea	Pending	7022043		TESTING
						SYSTEMS AND METHODS FOR BROADBAND
I 20, 2010		Republic of	Daniella -	10-2020-		COMMUNICATION LINK PERFORMANCE
Jan 30, 2019		Korea	Pending	7022375		MONITORING
		Republic of		10-2020-		METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012		Korea	Pending	7023155		MEASUREMENT OF A COMMUNICATION LINK
M2 2016		6:	B It	442040077461		SYSTEMS AND METHODS FOR IMPLEMENTING HIGH-
May 2, 2018		Singapore	Pending	11201907716X		SPEED WAVEGUIDE TRANSMISSION OVER WIRES
Dec 2, 2004	May 10, 2017	Spain	Issued	04801293.4	1721230	ADAPTIVE MARGIN AND BAND CONTROL
Mar 17, 2006	Sep 13, 2017	Spain	Issued	06727414.2	1911256	USER-PREFERENCE-BASED DSL SYSTEM
						DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE
Feb 28, 2006	May 23, 2012	Spain	Issued	06755837.9	1869790	PROFILE CONTROL
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						ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Dec 2, 2004	Nov 9, 2011	Spain	Issued	10179600.1	2259495	SYSTEM

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Date Filed - Priority	C D-4-	Country	C4-4	8	n_1_1	THE
Patent	Grant Date	Name	Status	Application #	Patent #	Title
Nov 2, 2010	Jan 10, 2018	Spain	Issued	10785244.4	300262370	DEVICE ABSTRACTION PROXY
11012,2020	5411 25, 2525	- Spain		20/0021111	00000000	
Aug 10, 2005	Oct 4, 2017	Spain	Issued	12154413.4	2472729	INTERFERENCE CANCELLATION SYSTEM
Mar 16, 2006	May 27, 2020	Spain	Issued	12179552.0	300368555	DSL SYSTEM TRAINING
			l	404005004	200070500	DELVICE ADOTE A CTION DECVI
Nov 2, 2010	Apr 11, 2018	Spain	Issued	12189530.4	300272582	DEVICE ABSTRACTION PROXY
						APPARATUS, SYSTEMS AND METHODS FOR IMPULSE
May 7, 2012	Aug 21, 2019	Spain	Issued	12721143.1	300332219	NOISE DETECTION AND MITIGATION
Way 7, 2012	Aug 21, 2013	эрапт	1330.60	12721143.1	300332213	NOISE DETECTION AND WITHGATION
						OPTIMIZED CONTROL SYSTEM FOR AGGREGATION
						OF MULTIPLE BROADBAND CONNECTIONS OVER
Sep 29, 2012	May 30, 2018	Spain	Issued	12773465	2901632	RADIO INTERFACES
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						METHOD AND SYSTEM FOR CONNECTIVITY
Oct 9, 2012	Dec 27, 2017	Spain	Issued	12780966.3	300261518	DIAGNOSTICS IN COMMUNICATION SYSTEMS
						SYSTEMS METHODS AND APPARATUSES FOR
			l			IMPLEMENTING DISTRIBUTED WIRELESS DATA
Dec 17, 2013	Mar 27, 2019	Spain	Issued	13821031.5	3114891	SHARING AND CONTROL SYSTEMS
						CYCTEMS AND METHODS FOR TRAFFIC LOAD
						SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011	Apr 18, 2018	Spain	Issued	117970970	300272601	MULTIPLE DISTINCT LAN NETWORKS
Dec 3, 2011	7(p) 10, 2010	Spain	133464	117370370	300272001	WOLTH LE DISTINCT DIN NETWORKS
						SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING
Jan 12, 2011	Apr 4, 2018	Spain	Issued	E11700879	2664103	WAN AND LAN NETWORK COMMUNICATIONS
		·				
						DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE
Feb 28, 2006	May 23, 2012	Sweden	Issued	06755837.9	1869790	PROFILE CONTROL
						SYSTEMS AND METHODS FOR TRAFFIC
D F 2011	NA22 2040	Cd.		11002025	2700424	AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011	May 22, 2019	Sweden	Issued	11802826.5	2789134	MULTIPLE DISTINCT LAN NETWORKS
Mar 16, 2006	May 27, 2020	Sweden	Issued	12179552.0	2549728	DSL SYSTEM TRAINING
,	, 2., 2020					
						METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012	Jan 2, 2019	Sweden	Issued	12743284.7	2873195	MEASUREMENT OF A COMMUNICATION LINK
						OPTIMIZED CONTROL SYSTEM FOR AGGREGATION
						OF MULTIPLE BROADBAND CONNECTIONS OVER
Sep 29, 2012	May 30, 2018	Sweden	Issued	12773465	2901632	RADIO INTERFACES

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Date Filed - Priority Patent	Grant Date	Country Name	Status	Application #	Patent #	Title
Dec 5, 2011	Apr 18, 2018	Sweden	Issued	117970970	2789133	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Dec 2, 2004	Nov 16, 2011	Switzerland	Issued	04801291.8	1700423	DHL SYSTEM ESTIMATION AND PARAMETER RECOMMENDATION
Dec 2, 2004	May 10, 2017	Switzerland	Issued	04801293.4	1721230	ADAPTIVE MARGIN AND BAND CONTROL
Dec 2, 2004	Apr 28, 2010	Switzerland	Issued	04801294.2	1700410	ADAPTIVE FEC CODEWORD MANAGEMENT
Mar 18, 2005	Aug 3, 2011	Switzerland	Issued	05708773.6	1733550	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
May 18, 2005	Jan 4, 2012	Switzerland	Issued	05741016.9	1756963	Dynamic management of communication system
Feb 28, 2006	Feb 21, 2018	Switzerland	Issued	06710503.1	1880503	PHANTOM USE IN DSL SYSTEMS
Mar 16, 2006	May 9, 2018	Switzerland	Issued	06727405.0	1897306	TONAL PRECODING IN MULTI-USER VECTORED DSL TRANSMISSION
Mar 17, 2006	Sep 13, 2017	Switzerland	Issued	06727414.2	1911256	USER-PREFERENCE-BASED DSL SYSTEM
Feb 28, 2006	May 23, 2012	Switzerland	Issued	06755837.9	1869790	DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL
Jul 8, 2006	Jul 28, 2017	Switzerland	Issued	06786827	1869790	ADAPTIVE MARGIN AND BAND CONTROL
Jul 31, 2007	Oct 18, 2017	Switzerland	Issued	07810931.1	2055086	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE
Oct 5, 2007	Mar 28, 2018	Switzerland	Issued	07852551.6	2076972	INTERFERENCE CANCELLATION SYSTEM
Dec 2, 2004	May 13, 2015	Switzerland	Issued	10152127.6	2187558	ADAPTIVE FEC CODEWORD MANAGEMENT
Dec 2, 2004	Nov 9, 2011	Switzerland	Issued	10179600.1	2259495	ADAPTIVE MARGIN AND BAND CONTROL IN A DSL SYSTEM

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title
Mar 18, 2005	May 6, 2020	Switzerland	Issued	10182701.2	2278785	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
IVIAI 18, 2003	Way 0, 2020	Switzerianu	issueu	10182701.2	22/6/63	HIGH 3FEED MOETIFEE LOOP D3E 3131EM
Nov 2, 2010	Jan 10, 2018	Switzerland	Issued	10785244.4	2497226	DEVICE ABSTRACTION PROXY
Jun 6, 2007	Apr 4, 2018	Switzerland	Issued	11161331.1	2337371	VECTORED DSL SYSTEM
						SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING
Jan 12, 2011	Apr 4, 2018	Switzerland	Issued	11700879	2664103	WAN AND LAN NETWORK COMMUNICATIONS
						SYSTEMS AND METHODS FOR TRAFFIC
						AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011	May 22, 2019	Switzerland	Issued	11802826.5	2789134	MULTIPLE DISTINCT LAN NETWORKS
Aug 10, 2005	Oct 4, 2017	Switzerland	Issued	12154413.4	2472729	INTERFERENCE CANCELLATION SYSTEM
	,					
						DYNAMIC DIGITAL COMMUNICATION SYSTEM
May 31, 2002	Dec 12, 2012	Switzerland	Issued	12167376.8	2533436	CONTROL
Nov 2, 2010	Apr 11, 2018	Switzerland	Issued	12189530.4	2602958	DEVICE ABSTRACTION PROXY
				407440404	2020077	SYSTEM FOR DIAGNOSING AND OPTIMIZING
Mar 19, 2012	Jul 18, 2018	Switzerland	Issued	12711318.1	2828977	VECTORED DSL LINE
						OPTIMIZED CONTROL SYSTEM FOR AGGREGATION
Sep 29, 2012	May 30, 2018	Switzerland	Issued	12773465	2901632	OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES
000 23, 2012	1114 55, 2515	o with the same	1004.04	22770.00	2301002	TO STORY TO
						METHOD AND SYSTEM FOR CONNECTIVITY
Oct 9, 2012	Dec 27, 2017	Switzerland	Issued	12780966.3	2907269	DIAGNOSTICS IN COMMUNICATION SYSTEMS
						METHODS SYSTEMS AND ADDADATUSES FOR
						METHODS SYSTEMS, AND APPARATUSES FOR IMPLEMENTING UPSTREAM POWER CONTROL FOR
Apr 23, 2013	Jun 6, 2018	Switzerland	Issued	13721852.5	3020138.00	DSL
						SYSTEMS METHODS AND APPARATUSES FOR
D 47 0040				42024027	244.55	IMPLEMENTING DISTRIBUTED WIRELESS DATA
Dec 17, 2013	Mar 27, 2019	Switzerland	Issued	13821031.5	3114891	SHARING AND CONTROL SYSTEMS
Mar 16, 2006	Jan 17, 2018	Switzerland	Issued	067446302	2789133	SELF-LEARNING AND SELF-ADJUSTING DSL SYSTEM
,30		anid				, , , , , , , , , , , , , , , , , , ,
						SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011	Apr 18, 2018	Switzerland	Issued	117970970	2789133	MULTIPLE DISTINCT LAN NETWORKS

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent#	Title
Aug 10, 2005	Jan 9, 2013	Switzerland	Issued	2005850646	1784923	INTERFERENCE CANCELLATION SYSTEM
						DIA CNOSTIC METHODS FOR TAUSTED BAIR
						DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA
Apr 13, 2012	Feb 21, 2018	Switzerland	Issued	20127175388	2837168	DISTRIBUTION ANALYSIS
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						DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE
Feb 28, 2006	May 23, 2012	Turkey	Issued	06755837.9	1869790	PROFILE CONTROL
		United				
Dec 2, 2004	Apr 28, 2010	Kingdom	Issued	04801294.2	1700410	ADAPTIVE FEC CODEWORD MANAGEMENT
2002,2001	7 (5. 23) 2313	ıguu	100000	0.00125.12	1,00.120	THE TEST SECTION OF THE TE
		United				
Mar 18, 2005	Aug 3, 2011	Kingdom	Issued	05708773.6	EP1733550	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
		United				
May 18, 2005	Jan 4, 2012	Kingdom	Issued	05741016.9	1756963	Dynamic management of communication system
	,					
		United				
May 18, 2005	Jan 14, 2009	Kingdom	Issued	05747117.9	1757042	INCENTIVE-BASED DSL SYSTEM
		United				
Feb 28, 2006	Feb 21, 2018	Kingdom	Issued	06710503.1	1880503	PHANTOM USE IN DSL SYSTEMS
,	,	Ü				
		United				
Mar 16, 2006	May 8, 2019	Kingdom	Issued	06710580.9	1894401	DSL SYSTEM TRAINING
		United				TONAL PRECODING IN MULTI-USER VECTORED DSL
Mar 16, 2006	May 9, 2018	Kingdom	Issued	06727405.0	1897306	TRANSMISSION
•	, ,	J				
		United	l	0.53034		
Mar 17, 2006	Sep 13, 2017	Kingdom	Issued	06727414.2	1911256	USER-PREFERENCE-BASED DSL SYSTEM
		United				
Mar 16, 2006	Jan 26, 2011	Kingdom	Issued	06744467.9	1894377	DSL SYSTEM LOADING AND ORDERING
F-1-20, 2005	M22 2015	United		06755007.0	1000700	DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE
Feb 28, 2006	May 23, 2012	Kingdom	Issued	06755837.9	1869790	PROFILE CONTROL
		United				
Oct 3, 2006	Jul 8, 2020	Kingdom	Issued	6816102.5	1932076	DSL SYSTEM
I 24 2007	0-1-10-2017	United	laare d	07010001 1	2055005	METHOD AND APPARATUS FOR ANALYZING AND
Jul 31, 2007	Oct 18, 2017	Kingdom	Issued	07810931.1	2055086	MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE

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Date Filed - Priority Patent	Grant Date	Country Name	Status	Application#	Patent #	Title
ratent	Grant Date	Name	Status	Application #	ratenta	THE
		United				
Oct 5, 2007	Mar 28, 2018	Kingdom	Issued	07852551.6	2076972	INTERFERENCE CANCELLATION SYSTEM
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		United				
Dec 2, 2004	May 13, 2015	Kingdom	Issued	10152127.6	2187558	ADAPTIVE FEC CODEWORD MANAGEMENT
D 00004		United		101705001	2250405	ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Dec 2, 2004	Nov 9, 2011	Kingdom	Issued	10179600.1	2259495	SYSTEM
		United				
Mar 18, 2005	May 6, 2020	Kingdom	Issued	10182701.2	2278785	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
Wiai 10, 2003	Way 0, 2020	Kiliguoiii	1330.00	10182701.2	2270703	THOUSE LED WOLTH LE LOOF DE STSTEW
		United				
Nov 2, 2010	Jan 10, 2018	Kingdom	Issued	10785244.4	2497226	DEVICE ABSTRACTION PROXY
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		United				
Jun 6, 2007	Apr 4, 2018	Kingdom	Issued	11161331.1	2337371	VECTORED DSL SYSTEM
		United				SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING
Jan 12, 2011	Apr 4, 2018	Kingdom	Issued	11700879.7	2664103	WAN AND LAN NETWORK COMMUNICATIONS
						CVCTENC AND METHODS FOR TRAFFIC
		United				SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011	May 22, 2019	Kingdom	Issued	11802826.5	2789134	MULTIPLE DISTINCT LAN NETWORKS
Dec 3, 2011	1VIU 22, 2013	Kiligaoiii	133464	11002020.5	2,03134	WOETH EL DISTRICT EAR RETWORKS
		United				
Aug 10, 2005	Oct 4, 2017	Kingdom	Issued	12154413.4	2472729	INTERFERENCE CANCELLATION SYSTEM
		United				DYNAMIC DIGITAL COMMUNICATION SYSTEM
May 31, 2002	Dec 12, 2012	Kingdom	Issued	12167376.8	2533436	CONTROL
		United				
Mar 16, 2006	May 27, 2020	United Kingdom	Issued	12179552.0	2549728	DSL SYSTEM TRAINING
17101 10, 2000	IVIGY 27, 2020	KIIIBUUIII	issucu	121/3332.0	2343720	DOLOTOTEN TIVAINING
		United				
Nov 2, 2010	Apr 11, 2018	Kingdom	Issued	12189530.4	2602958	DEVICE ABSTRACTION PROXY
		United				SYSTEM FOR DIAGNOSING AND OPTIMIZING
Mar 19, 2012	Jul 18, 2018	Kingdom	Issued	12711318.1	2828977	VECTORED DSL LINE
		11				DIAGNOSTIC METHODS FOR TWISTED PAIR
Apr 13, 2012	Feb 21, 2018	United Kingdom	Issued	12717538.8	2837168	TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS
Thi 13, 2012	res 21, 2018	KIIIKAOIII	issueu	12/1/330.8	203/108	DISTRIBUTION ANALTSIS
		United				APPARATUS, SYSTEMS AND METHODS FOR IMPULSE
May 7, 2012	Aug 21, 2019	Kingdom	Issued	12721143.1	2847914	NOISE DETECTION AND MITIGATION
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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent#	Title
		United				METHOD AND SYSTEM FOR PERFORMANCE
Jul 13, 2012	Jan 2, 2019	Kingdom	Issued	12743284.7	2873195	MEASUREMENT OF A COMMUNICATION LINK
		United				OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER
Sep 29, 2012	May 30, 2018	Kingdom	Issued	12773465	2901632	RADIO INTERFACES
3CP 23) 2012	1114 30, 2010	Kingdoni	105000	12773103	2501032	TV DIO INTERNATORES
		United				METHOD AND SYSTEM FOR CONNECTIVITY
Oct 9, 2012	Dec 27, 2017	Kingdom	Issued	12780966.3	2907269	DIAGNOSTICS IN COMMUNICATION SYSTEMS
						METHODS SYSTEMS, AND APPARATUSES FOR
A 22 2042	L 6 2010	United	1	42724052	2020420	IMPLEMENTING UPSTREAM POWER CONTROL FOR
Apr 23, 2013	Jun 6, 2018	Kingdom	Issued	13721852	3020138	DSL
		United				
Aug 30, 2013	May 6, 2020	Kingdom	Issued	13763375.6	3039850	LOW POWER SYSTEM AND METHOD FOR DSL LINES
<u> </u>	, ,	J				
						SYSTEMS METHODS AND APPARATUSES FOR
		United				IMPLEMENTING DISTRIBUTED WIRELESS DATA
Dec 17, 2013	Mar 27, 2019	Kingdom	Issued	13821031.5	3114891	SHARING AND CONTROL SYSTEMS
		United				ADAPTIVE MARGIN AND BAND CONTROL IN A DSL
Dec 2, 2004	May 10, 2017	Kingdom	Issued	048012934	1721230	SYSTEM
	, 25, 252,	· · · · · · · · · · · · · · · · · · ·	100000			
		United				
Mar 16, 2006	Jan 17, 2018	Kingdom	Issued	067446302		SELF-LEARNING AND SELF-ADJUSTING DSL SYSTEM
		United				DSL NOISE CANCELLATION USING SUB-OPTIMAL
Mar 4, 2009	Jul 24, 2019	Kingdom	Issued	097894950	2404385	NOISE REFERENCE SIGNALS
111111111111111111111111111111111111111	341 2 1) 2013	Kiligaoiii	133464	037031330	2 10 1303	THOISE HEI ENERGE SIGNALS
						SYSTEMS AND METHODS FOR TRAFFIC LOAD
		United				BALANCING ON MULTIPLE WAN BACKHAULS AND
Dec 5, 2011	Apr 18, 2018	Kingdom	Issued	117970970	2789133	MULTIPLE DISTINCT LAN NETWORKS
		United				
Aug 10, 2005	Jan 9, 2013	United Kingdom	Issued	2005850646	1784923	INTERFERENCE CANCELLATION SYSTEM
	5311 5, 2015		Joucu	2003030040	1,04525	THE ENGINEE CANGELLATION STOTEM
		United				
Mar 17, 2006	May 31, 2017	Kingdom	Issued	2006727480	1897305	Tonal predictive GDFE
		<i>.</i> .				
Jul 8, 2006	May 10, 2017	United Kingdom	Issued	2006786827	1905164	ADAPTIVE MARGIN AND BAND CONTROL
Jul 0, 2000	191ay 10, 2017	KIIIguUIII	issueu	2000/0002/	1303104	ADAL TIVE IVIANGIN AND DAND CONTROL
		United			EP200779583	
Jun 6, 2007	Aug 10, 2011	Kingdom	Issued	2007795837	7	VECTORED DSL SYSTEM
NA10 2010	C F 2040	United	1	20107107020	25,00000	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE
May 10, 2010	Sep 5, 2018	Kingdom	Issued	20107197030	2569929	TESTING

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title
May 29, 2020	Mar 4, 2020	United Kingdom	Issued	EP09790028.6	2449758	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK
Feb 8, 2016	Feb 20, 2018	USA	Issued	14/910,879		LOW POWER SYSTEM AND METHOD FOR DSL LINES
May 6, 2014		USA	Allowed	14/356,581		METHOD, APPARATUS, AND SYSTEM FOR OPTIMIZING PERFORMANCE OF A COMMUNICATION UNIT BY A REMOTE SERVER
Feb 23, 2017		USA	Allowed	15/506,225		METHOD AND APPARATUS FOR PROVIDING PERFORMANCE AND USAGE INFORMATION FOR A WIRELESS LOCAL AREA NETWORK
Feb 19, 2019		USA	Allowed	16/279,584		METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS
Jan 20, 2020		USA	Allowed	16/747,270		METHODS AND APPARATUS FOR DETECTING INTERNET CONNECTION PROBLEMS
Jun 14, 2020		USA	Allowed	16/900,965		METHODS SYSTEMS, AND APPARATUSES FOR IMPLEMENTING UPSTREAM POWER CONTROL FOR DSL
Jun 8, 2001	Jan 2, 2007	USA	lssued	09/877,724	7158563	DYNAMIC DIGITAL COMMUNICATION SYSTEM CONTROL
Mar 8, 2004	Sep 23, 2008	USA	Issued	10/795,593	7428669	ADAPTIVE FEC CODEWORD MANAGEMENT
Widi 6, 2004	3cp 23, 2000	03/(	135400	10,753,553	7420003	ADM THE LEE CODEWORD WANTAGENERY
Mar 25, 2004	Dec 29, 2009	USA	Issued	10/808,771	7639596	HIGH SPEED MULTIPLE LOOP DSL SYSTEM
Apr 2, 2004	Nov 27, 2007	USA	Issued	10/817,128	7302379	DSL SYSTEM ESTIMATION AND PARAMETER RECOMMENDATION
Jul 19, 2004	Jul 7, 2009	USA	Issued	10/893,826	7558315	ADAPTIVE MARGIN AND BAND CONTROL IN DIGITAL SUBSCRIBER LINE (DSL) SYSTEMS
Aug 20, 2004	Aug 11, 2009	USA	Issued	10/922,705	7573943	INTERFERENCE CANCELLATION SYSTEM
-0, 200				,22,,-33	. 3,00 10	
Mar 3, 2005	Dec 2, 2008	USA	Issued	11/071,762	7460588	DIGITAL SUBSCRIBER LINE (DSL) STATE AND LINE PROFILE CONTROL
May 5, 2005	Sep 22, 2009	USA	Issued	11/122,365	7593458	FEXT DETERMINATION SYSTEM

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent#	Title
May 5, 2005	Oct 20, 2009	USA	Issued	11/122,428	7606350	INCENTIVE-BASED DSL SYSTEM
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Aug 9, 2010	Nov 13, 2012	USA	Issued	11/267,623	7773497	PHANTOM USE IN DSL SYSTEMS
Nov 22, 2005	Aug 10, 2010	USA	Issued	11/284,692	7774398	TONAL ROTORS
Jan 20, 2006	Oct 12, 2010	USA	Issued	11/336,113	7813420	ADAPTIVE GDFE
	,					
Jan 20, 2006	Oct 19, 2010	USA	Issued	11/336,666	7817745	TONAL PRECODING
Jan 28, 2006	Feb 1, 2011	USA	Issued	11/341,969	7881438	SELF-LEARNING AND SELF-ADJUSTING DSL SYSTEM
Jan 28, 2006	Mar 3, 2015	USA	Issued	11/342,003	8972549	USER-PREFERENCE-BASED DSL SYSTEM
	·					
Jan 28, 2006	Feb 3, 2015	USA	Issued	11/342,023	8948026	USER-PREFERENCE-BASED DSL SYSTEM
Jan 28, 2006	Mar 23, 2010	USA	Issued	11/342,024	7684546	DSL SYSTEM ESTIMATION AND CONTROL
Feb 1, 2006	Dec 14, 2010	USA	Issued	11/344,873	7852952	DSL SYSTEM LOADING AND ORDERING
·	·					
Feb 1, 2006	Aug 2, 2011	USA	Issued	11/345,215	7991122	DSL SYSTEM TRAINING
Feb 28, 2006	Feb 2, 2010	USA	Issued	11/363,769	7657818	DYNAMIC MINIMUM-MEMORY INTERLEAVING
Mar 3, 2006	Mar 30, 2010	USA	Issued	11/367,930	7688884	VECTORED DSL NESTING
	·					
B 0.0555			l	44/65 5 5 5	005155	DYNAMIC DIGITAL COMMUNICATION SYSTEM
Dec 8, 2006	Dec 20, 2011	USA	Issued	11/636,316	8081704	CONTROL
Aug 30, 2007	Oct 25, 2011	USA	Issued	11/897,683	8045629	DSL DATA COLLECTION SYSTEM

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent#	Title
Nov 26, 2007	May 4, 2010	USA	Issued	11/945,210	7711530	DHL SYSTEM ESTIMATION AND PARAMETER RECOMMENDATION
Jul 8, 2006	Apr 12, 2011	USA	Issued	11/995,194	7924736	DSL SYSTEM ESTIMATION
Jul 8, 2006	Nov 9, 2010	USA	Issued	11/995,195	7830955	ADAPTIVE MARGIN AND BAND CONTROL
Feb 8, 2008	Jul 16, 2013	USA	Issued	12/028,738	8489344	HOME NETWORK SYSTEM AUGMENTATION WITH REMOTE GUIDANCE AND LOCAL SET UP AND MONITORING
Apr 2, 2008	Aug 30, 2011	USA	Issued	12/089,044	8009665	DSL SYSTEM
Aug 4, 2008	Oct 5, 2010	USA	Issued	12/185,729	7809996	ADAPTIVE FEC CODEWORD MANAGEMENT
Apr 27, 2007	Dec 2, 2014	USA	Issued	12/226,910	8902958	METHODS AND APPARATUS TO COMBINE DATA FROM MULTIPLE SOURCES TO CHARACTERIZE COMMUNICATION SYSTEMS
Apr 27, 2007	Feb 4, 2014	USA	Issued	12/226,939	8644169	METHODS AND APPARATUS TO PERFORM LINE TESTING AT CUSTOMER PREMISES
Jun 6, 2007	Jul 9, 2013	USA	Issued	12/227,966	8483369	DSL SYSTEM
Jul 31, 2007	Apr 23, 2013	USA	Issued	12/375,216	8428225	METHOD AND APPARATUS FOR ANALYZING AND MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE
Mar 11, 2009	May 20, 2014	USA	Issued	12/402,339	8730785	METHOD AND APPARATUS FOR REDUCING NOISE IN A COMMUNICATION SYSTEM
Oct 5, 2007	Dec 25, 2012	USA	Issued	12/444,381	8340279	INTERFERENCE CANCELLATION SYSTEM
Dec 7, 2007	Jan 29, 2013	USA	Issued	12/517,525	8363788	DSL RING SIGNAL COMPATIBILITY
		USA	Issued	12/853,209	8310914	PHANTOM USE IN DSL SYSTEM
Nov 5, 2010	Oct 4, 2011	USA	Issued	12/940,970	8031761	ADAPTIVE MARGIN AND BAND CONTROL

Date Filed - Priority Patent	Grant Date	Country Name	Status	Application#	Patent#	Title
Jan 26, 2015	Apr 10, 2018	USA	Issued	13/084,829	9071534	DSL SYSTEM ESTIMATION
Jul 29, 2011	Jun 24, 2014	USA	Issued	13/194,736	8761348	DSL SYSTEM TRAINING
Aug 22, 2011	Dec 1, 2015	USA	Issued	13/214,598	9203724	DSL SYSTEM
Mar 4, 2009	Nov 4, 2017	USA	Issued	13/254,454	9819388	DSL NOISE CANCELLATION
Jul 1, 2009	Jan 19, 2016	USA	Issued	13/376,742	9241077	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK
Aug 16, 2012	May 17, 2016	USA	Issued	13/511,632	9344294	DEVICE ABSTRACTION PROXY
Nov 25, 2009	Aug 11, 2015	USA	Issued	13/512,262	9106735	DETECTION OF WIRING DEFECTS
						DYNAMIC DIGITAL COMMUNICATION SYSTEM
Jun 19, 2012	Mar 25, 2014	USA	Issued	13/527,074	8681897	CONTROL
Aug 17, 2012	Nov 19, 2013	USA	Issued	13/554,945	8589093	HOME NETWORK SYSTEM AUGMENTATION WITH REMOTE GUIDANCE AND LOCAL SET UP AND MONITORING
<u>,</u>	,			, ,		
Sep 11, 2012	Jun 21, 2016	USA	Issued	13/610,195	9374240	DEVICE ABSTRACTION PROXY
Mar 4, 2013	Jul 29, 2014	USA	Issued	13/696,798	8792620	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING
War 17 2013	54. 23, 2521	00/1	issueu	10,000,00	0752020	- Italian in the state of the s
Jul 8, 2014	Jun 14, 2016	USA	Issued	13/995,900	9369370	SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING WAN AND LAN NETWORK COMMUNICATIONS
Nov 11, 2013	Jan 1, 2019	USA	Issued	13/995,901	10171298	MANAGEMENT CENTER FOR COMMUNICATION SYSTEM CUSTOMER PREMISES EQUIPMENT
						METHOD AND APPARATUS FOR ANALYZING AND
Jan 23, 2014	Jul 12, 2016	USA	Issued	14/162,133	9391744	MITIGATING NOISE IN A DIGITAL SUBSCRIBER LINE
Mar 17, 2014	Oct 13, 2015	USA	Issued	14/216,573	9160385	DYNAMIC DIGITAL COMMUNICATION SYSTEM CONTROL

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Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application#	Patent#	Title
Apr 1, 2014	May 31, 2016	USA	Issued	14/242,164	9356654	METHOD AND APPARATUS FOR REDUCING NOISE IN A COMMUNICATION SYSTEM
Jul 25, 2014	May 7, 2019	USA	Issued	14/341,659	10284713	NON-INVASIVE DIAGNOSTIC TRANSMISSION LINE TESTING
Jun 3, 2014	Nov 14, 2017	USA	Issued	14/362,584	9819595	SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Jun 3, 2014	Dec 19, 2017	USA	Issued	14/362,585	9847944	SYSTEMS AND METHODS FOR TRAFFIC LOAD BALANCING ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Dec 15, 2011	Jul 12, 2016	USA	Issued	14/365,604	9391668	METHOD AND APPARATUS FOR REDUCING THE POWER OF A SIGNAL ELECTROMAGNETICALLY COUPLED FROM A PLC MEDIUM TO A DSL MEDIUM
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Mar 12, 2012	Jul 12, 2016	USA	Issued	14/384,368	9391834	APPARATUS, SYSTEMS AND METHODS OF COMMON- MODE REJECTION RATIO BASED DIAGNOSTICS
Mar 19, 2012	Jun 16, 2015	USA	Issued	14/385,679	9060054	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINE
Apr 13, 2012	Aug 16, 2016	USA	Issued	14/394,074	9420090	DIAGNOSTIC METHODS FOR TWISTED PAIR TELEPHONE LINES BASED ON LINE DATA DISTRIBUTION ANALYSIS
Арі 13, 2012	Aug 10, 2010	USA	issueu	14/394,074	9420090	DISTRIBUTION ANALTSIS
Oct 30, 2014	Oct 3, 2017	USA	Issued	14/398,069	9780956	APPARATUS, SYSTEMS AND METHODS FOR DSM ENERGY MANAGEMENT
May 7, 2012	Jun 14, 2016	USA	Issued	14/399,151	9369232	APPARATUS, SYSTEMS AND METHODS FOR IMPULSE NOISE DETECTION AND MITIGATION
Aug 12, 2015	Aug 6 2010	LIEV	locued	14/414 435	10375590	METHOD AND SYSTEM FOR PERFORMANCE
Aug 12, 2013	Aug 6, 2019	USA	Issued	14/414,435	103/3330	ESTIMATION OF A COMMUNICATION LINK
lon 12, 2015	Nov 10, 2010	LICA	lssuad	14/414 427	10494361	METHOD AND SYSTEM FOR PERFORMANCE
Jan 12, 2015	Nov 19, 2019	USA	Issued	14/414,437	10484261	MEASUREMENT OF A COMMUNICATION LINK
Jan 26, 2015	Apr 24, 2018	USA	Issued	14/417,544	9954631	MANAGEMENT SYSTEM AND METHODS OF MANAGING TIME-DIVISION DUPLEX (TDD) TRANSMISSION OVER COPPER
Mar 27, 2015	Aug 28, 2018	USA	Issued	14/431,774	10064095	OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES
IVIAI 27, 2013	Aug 20, 2010	UJA	issueu	14/431,//4	10004033	NADIO INTENTACES
Apr 7, 2015	Feb 19, 2019	USA	Issued	14/434,073	10212062	METHOD AND SYSTEM FOR LATENCY MEASUREMENT IN COMMUNICATION SYSTEMS

Date Filed - Priority		Country				
Patent	Grant Date	Name	Status	Application #	Patent #	Title
Apr 7, 2015	Feb 20, 2018	USA	Issued	14/434,076	9900228	METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS
Nov 19, 2012	Feb 7, 2017	USA	Issued	14/443,999	9565294	SYSTEMS, METHODS, AND APPARATUSES FOR OPTIMIZING DSL LINE CONFIGURATIONS AND PARAMETERS IN A DSL SYSTEM
June 6, 2006	April 10, 2018	USA	Issued	14/605,911	9941928	SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING A DSL SYSTEM
Feb 24, 2015	Nov 3, 2015	USA	Issued	14/630,569	9178777	USER-PREFERENCE-BASED DSL SYSTEM
Apr 13, 2015	Mar 3, 2020	USA	Issued	14/685,522	10581683	DSL SYSTEM
Jun 15, 2015	Jul 19, 2016	USA	Issued	14/740,123	9398146	SYSTEM FOR DIAGNOSING AND OPTIMIZING VECTORED DSL LINE
Jul 24, 2015	May 8, 2018	USA	Issued	14/763,486	9967156	METHOD AND APPARATUS FOR CLOUD SERVICES FOR ENHANCING BROADBAND EXPERIENCE
Aug 31, 2015	Feb 20, 2018	USA	Issued	14/771,789	9900049	SYSTEMS AND METHODS FOR MANAGING MIXED DEPLOYMENTS OF VECTORED AND NON-VECTORED VDSL
Sep 24, 2015	Mar 12, 2019	USA	Issued	14/779,942	10231138	METHOD AND APPARATUS FOR IMPLEMENTING WIRELESS SYSTEM DISCOVERY AND CONTROL USING A STATE-SPACE
Jul 29, 2016	Mar 5, 2019	USA	Issued	14/786,438	10225147	METHODS SYSTEMS, AND APPARATUSES FOR IMPLEMENTING UPSTREAM POWER CONTROL FOR DSL
Oct 7, 2015	Dec 12, 2017	USA	Issued	14/877,720	9843348	DYNAMIC DIGITAL COMMUNICATION SYSTEM CONTROL
Nov 13, 2015	Apr 16, 2019	USA	Issued	14/891,320	10263866	DSL NEIGHBORHOOD DIAGNOSTICS
						METHOD AND APPARATUS FOR CONTINUOUS ACCESS NETWORK MONITORING AND PACKET LOSS
Jul 31, 2013 Feb 8, 2016	Mar 12, 2019 Jun 19, 2020	USA	Issued	14/907,655 14/910,879	10230610	LOW POWER SYSTEM AND METHOD FOR DSL LINES
		USA	Issued		9900442	
Nov 25, 2015	Jul 16, 2019	USA	Issued	14/952,635	10356151	VIDEO STREAMING DIAGNOSTICS

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Patent	Grant Date	Name	Status	Application #	Patent #	ricie
Dec 29, 2015	Aug 14, 2018	USA	Issued	14/983,367	10050725	METHOD AND APPARATUS FOR DSL PERFORMANCE ENHANCEMENT IN A DSL NETWORK
Mar 17, 2016	Jul 10, 2018	USA	Issued	15/022,752	10020999	SYSTEM AND METHOD FOR VALIDATING BROADBAND SERVICE RECOMMENDATION
Apr 12, 2016	May 21, 2019	USA	Issued	15/028,932	10298474	AUTOMATIC BROADBAND INFORMATION CORRELATION & RECORD GENERATION
Nov 7, 2013	Jan 2, 2018	USA	Issued	15/034,856	9860111	METHOD AND APPARATUS FOR DIAGNOSING AND CONFIGURING A BROADBAND CONNECTION VIA AN ALTERNATE COMMUNICATION PATH
Jun 13, 2016	May 8, 2018	USA	Issued	15/104,222	9967757	SYSTEMS METHODS AND APPARATUSES FOR IMPLEMENTING DISTRIBUTED WIRELESS DATA SHARING AND CONTROL SYSTEMS
Jul 29, 2016	Aug 14, 2018	USA	Issued	15/115,618	10051117	SYSTEMS, METHODS, AND APPARATUSES FOR IDENTIFYING CABLE-LEVEL FAULTS IN A COPPER PLANT OF A DSL SYSTEM
May 2, 2016	Sep 19, 2017	USA	Issued	15/144,082	9768830	METHOD AND APPARATUS FOR REDUCING NOISE IN A COMMUNICATION SYSTEM
Jun 14, 2016	Jun 25, 2019	USA	Issued	15/182,513	10333819	SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING WAN AND LAN NETWORK COMMUNICATIONS
Jun 21, 2016	Aug 14, 2018	USA	Issued	15/188,959	10050846	DEVICE ABSTRACTION PROXY
Nov 30, 2016	May 19, 2020	USA	Issued	15/315,348	10659323	METHOD AND APPARATUS FOR IMPROVING BROADBAND EXPERIENCE USING CLOUD BASED RECOMMENDATION ENGINE
Nov 30, 2016	Oct 8, 2019	USA	Issued	15/315,364	10440591	METHOD AND APPARATUS FOR GENERATING POLICIES FOR IMPROVING NETWORK SYSTEM PERFORMANCE
Dec 29, 2016	Aug 12, 2020			15/323,087		METHOD AND APPARATUS FOR WI-FI DEVICE TYPE IDENTIFICATION AND DEVICE TYPE BASED DIAGNOSTICS AND OPTIMIZATION
		USA	Issued		10098057	METHOD AND SYSTEM FOR CONNECTIVITY
Mar 28, 2017	Oct 22, 2019	USA	Issued	15/471,779	10454797	DIAGNOSTICS IN COMMUNICATION SYSTEMS
					40	SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING PERSISTENT MANAGEMENT AGENT (PMA) FUNCTIONS FOR THE CONTROL AND
Feb 22, 2017	Sep 22, 2020	USA	Issued	15/505,866	10785053	COORDINATION OF DPU AND DSLAM COMPONENTS  SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING THE VIRTUALIZATION OF ACCESS
Feb 23, 2017	Aug 6, 2019	USA	Issued	15/506,102	10374887	NODE FUNCTIONS

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Date Filed - Priority Patent	Grant Date	Country Name	Status	Application#	Patent #	Title
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						METHOD AND APPARATUS FOR PREDICTING
Aug 10, 2017	Dec 17, 2019	USA	Issued	15/532,976	10512000	SUCCESSFUL DSL LINE OPTIMIZATION
						SYSTEMS, METHODS, AND APPARATUSES FOR
						IMPLEMENTING DSL LINE FAULT DETERMINATION
						AND LOCALIZATION VIA SELT, DELT, AND MELT
Jul 14, 2017	Dec 31, 2019	USA	Issued	15/543,793	10523810	DIAGNOSTICS
						METHODS AND APPARATUS FOR DETECTING
Feb 15, 2018	Feb 18, 2020	USA	Issued	15/753,159	10567266	INTERNET CONNECTION PROBLEMS
						SYSTEMS AND METHODS FOR TRAFFIC
						AGGREGATION ON MULTIPLE WAN BACKHAULS AND
Nov 10, 2017	Jan 7, 2020	USA	Issued	15/809,823	10530695	MULTIPLE DISTINCT LAN NETWORKS
Jan 8, 2018	Feb 4, 2020	USA	Issued	15/864,621	10554824	LOW POWER SYSTEM AND METHOD FOR DSL LINES
3411 0, 2010	100 7, 2020	JJA	issucu	13,004,021	10334024	2011 - OWER STSTEM AND WELLIOUT OR DUE LINES
						METHOD AND APPARATUS FOR WI-FI DEVICE TYPE
						IDENTIFICATION AND DEVICE TYPE BASED
Oct 8, 2018	Jun 30, 2020	USA	Issued	16/154,534	10701623	DIAGNOSTICS AND OPTIMIZATION
						METHODS SYSTEMS, AND APPARATUSES FOR
Mar 1, 2019	Jul 21, 2020	USA	Issued	16/290,073	10721128	IMPLEMENTING UPSTREAM POWER CONTROL FOR DSL
Wiai 1, 2015	301 21, 2020	03/4	133464	10/250,075	10721120	000
						METHOD AND APPARATUS FOR IMPLEMENTING
						WIRELESS SYSTEM DISCOVERY AND CONTROL USING
Mar 1, 2019	Jul 7, 2020	USA	Issued	16/290,094	10708793	A STATE-SPACE
Mar 26, 2019	lum 22, 2020	USA	laava al	10/205 480	10693755	BROADBAND ACCESS MANAGEMENT SYSTEMS AND
IVIAI 20, 2019	Jun 23, 2020	USA	Issued	16/365,486	10093733	METHODS
						SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING
Jun 5, 2019	Aug 25, 2020	USA	Issued	16/432,364	10757003	WAN AND LAN NETWORK COMMUNICATIONS
						METHOD AND OVERTEN FOR REPORT OF THE PROPERTY.
Jul 18, 2019	May 12, 2020	USA	Issued	16/516,209	10652773	METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK
Jul 10, 2013	IVIAY 12, 2020	UJA	issueu	10/310,203	10032773	ESTIMATION OF A COMMUNICATION LINK
						METHOD AND SYSTEM FOR USING A
						DOWNLOADABLE AGENT FOR A COMMUNICATION
Jan 12, 2015		USA	Pending	14/414,436		SYSTEM, DEVICE, OR LINK
Aug 12, 2015			Donding	14/767 070		CHI IDNI DDEDICTIONI INI A DROADDAND NETWORK
Aug 13, 2015		USA	Pending	14/767,870		CHURN PREDICTION IN A BROADBAND NETWORK
						SYSTEMS AND METHODS FOR TRAFFIC LOAD
						BALANCING ON MULTIPLE WAN BACKHAULS AND
Dec 18, 2017		USA	Pending	15/845,977		MULTIPLE DISTINCT LAN NETWORKS
						MANAGEMENT SYSTEM AND METHODS OF
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Mar 22, 2018		USA	Pending	15/928,583	<u> </u>	TRANSMISSION OVER COPPER

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May 2, 2018		USA	Pending	15/969,729		SYSTEMS AND METHODS FOR IMPLEMENTING HIGH- SPEED WAVEGUIDE TRANSMISSION OVER WIRES
Jul 20, 2018		USA	Pending	16/040,958		DEVICE ABSTRACTION PROXY
Aug 27, 2018		USA	Pending	16/114,097		OPTIMIZED CONTROL SYSTEM FOR AGGREGATION OF MULTIPLE BROADBAND CONNECTIONS OVER RADIO INTERFACES
Nov 15, 2018		USA	Pending	16/192,442		METHOD AND APPARATUS FOR CONTINUOUS ACCESS NETWORK MONITORING AND PACKET LOSS ESTIMATION
Jul 26, 2019		USA	Pending	16/523,854		SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING THE VIRTUALIZATION OF ACCESS NODE FUNCTIONS
Aug 9, 2019		USA	Pending	16/537,045		METHODS AND SYSTEMS FOR PERFORMANCE MEASUREMENT OF A COMMUNICATION LINK
Dec 10, 2019		USA	Pending	16/709,857		SERVICE TYPE IDENTIFICATION SYSTEMS AND METHODS FOR OPTIMIZING LOCAL AREA NETWORKS
Feb 27, 2020		USA	Pending	16/804,000		SYSTEMS AND METHODS FOR ERGODIC SPECTRUM MANAGEMENT
Apr 10, 2020		USA	Pending	16/846,276		METHOD AND SYSTEM FOR PERFORMANCE ESTIMATION OF A COMMUNICATION LINK
Apr 22, 2020		USA	Pending	16/855,986		METHOD AND APPARATUS FOR IMPROVING BROADBAND EXPERIENCE USING CLOUD BASED RECOMMENDATION ENGINE
Jun 14, 2020		USA	Pending	16/900,940		SYSTEMS AND METHODS FOR COMBINED MANAGEMENT WITH USER PREFERENCES OF WI-FI AND CELLULAR DATA
Jun 29, 2020	Jun 30, 2020	USA	Pending	16/916,038		METHOD AND APPARATUS FOR WI-FI DEVICE TYPE IDENTIFICATION AND DEVICE TYPE BASED DIAGNOSTICS AND OPTIMIZATION
Jul 11, 2020		USA	Pending	16/926,696		SYSTEMS AND METHODS FOR JOINTLY OPTIMIZING WAN AND LAN NETWORK COMMUNICATIONS
Jan 24, 2019		USA	Pending	16/937,566		SYSTEMS AND METHODS FOR NET NEUTRALITY TESTING
Jan 30, 2019		USA	Pending	16/937,570		SYSTEMS AND METHODS FOR BROADBAND COMMUNICATION LINK PERFORMANCE MONITORING

Date Filed - Priority Patent	Grant Date	Country Name	Status	Application#	Patent#	Title
Aug 11, 2020		USA	Pending	16/991,002		SYSTEMS, METHODS, AND APPARATUSES FOR IMPLEMENTING PERSISTENT MANAGEMENT AGENT (PMA) FUNCTIONS FOR THE CONTROL AND COORDINATION OF DPU AND DSLAM COMPONENTS
Sep 25, 2020		USA	Pending	17/033,437		WIRELESS-WIRELINE PHYSICALLY CONVERGED ARCHITECTURES
June 14, 2019		USA	Pending	62/861,979		ERGODIC SPECTRUM MANAGEMENT SYSTEMS AND METHODS
June 14, 2019		USA	Pending	62/861,993		ERGODIC SPECTRUM MANAGEMENT SYSTEMS AND METHODS
Jun 21, 2019		USA	Pending	62/864,869		SYSTEMS AND METHODS FOR COMBINED MANAGEMENT WITH USER PREFERENCES OF WI-FI AND CELLULAR DATA
Sep 27, 2019		USA	Pending	62/907,035		WIRELESS-WIRELINE PHYSICALLY CONVERGED ARCHITECTURES
Mar 10, 2020		USA	Pending	62/987,827		SYSTEM AND METHOD FOR CLOSED LOOP AUTOMATION BETWEEN WIRELESS NETWORK NODES
Apr 7, 2020		USA	Pending	63/006,628		USER PREFERENCE BASED HOME NETWORK OPTIMIZATION
May 12, 2020		USA	Pending	63/023,804		SYSTEMS AND METHODS FOR CLOSED LOOP AUTOMATION BETWEEN WIRELESS NETWORK NODES
May 17, 2020		USA	Pending	63/026,112		Systems and Methods for Telework
May 17, 2020		USA	Pending	63/026,112		Systems and Methods for Telework
Jul 28, 2020		USA	Pending	63/057,806		SYSTEMS AND METHODS FOR TELEWORK  WIRELESS-WIRELINE PHYSICALLY CONVERGED
Aug 24, 2020		USA	Pending	63/069,635		ARCHITECTURES
Sep 9, 2020		USA	Pending	63/076,209		SYSTEMS AND METHODS FOR TELEWORK
Sep 9, 2020		USA	Pending	63/076,263		ASSIA WORK FROM HOME EVENT

Date Filed - Priority	Grant Date	Country	Chah	A	M-112	Tall
Patent	Grant Date	Name USA	Status  Published	Application #	Patent#	SYSTEMS AND METHODS FOR CHAINING CONTROL- PLANE VIRTUAL FUNCTIONS FOR ENSURING END-TO- END QUALITY OF SERVICE (QOS) OF INTERNET
Jun 29, 2018		USA	Published	16/024,420		SERVICES
Apr 12, 2019		USA	Published	16/383,214		AUTOMATIC BROADBAND INFORMATION CORRELATION & RECORD GENERATION
Sep 18, 2019		USA	Published	16/575,101		METHOD AND APPARATUS FOR GENERATING POLICIES FOR IMPROVING NETWORK SYSTEM PERFORMANCE
Sep 20, 2019		USA	Published	16/577,462		METHOD AND SYSTEM FOR CONNECTIVITY DIAGNOSTICS IN COMMUNICATION SYSTEMS
Dec 5, 2019		USA	Published	16/705,180		SYSTEMS AND METHODS FOR TRAFFIC AGGREGATION ON MULTIPLE WAN BACKHAULS AND MULTIPLE DISTINCT LAN NETWORKS
Dec 10, 2019		USA	Published	16/709,620		METHOD AND APPARATUS FOR PREDICTING SUCCESSFUL DSL LINE OPTIMIZATION
Jan 13, 2020		USA	Published	16/741,210		LOW POWER SYSTEM AND METHOD FOR DSL LINES
Jan 15, 2020		USA	Published	16/743,821		DSL SYSTEMS AND METHODS
Mar 6, 2020		USA	Published	16/811,593		CONSTRAINED OPTIMIZATION OF WIRELESS LINKS IN NETWORKS WITH COMPETING OBJECTIVES
May 24, 2020		USA	Published	16/882,484		BROADBAND ACCESS MANAGEMENT SYSTEMS AND METHODS
May 30, 2020		USA	Published	16/888,684		METHOD AND APPARATUS FOR IMPLEMENTING WIRELESS SYSTEM DISCOVERY AND CONTROL USING A STATE-SPACE

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