

PATENT ASSIGNMENT COVER SHEET

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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
CRAY INC.	07/30/2021
RECEIVING PARTY DATA	
Name:	Hewlett Packard Enterprise Development LP
Street Address:	11445 Compaq Center Drive West
City:	Houston
State/Country:	TEXAS
Postal Code:	77070
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	17594649
CORRESPONDENCE DATA	
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ATTORNEY DOCKET NUMBER:	90964897
NAME OF SUBMITTER:	LAURA M. ZAVALA
SIGNATURE:	/Laura M. Zavala/
DATE SIGNED:	11/10/2021
Total Attachments: 23	
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PATENT ASSIGNMENT AGREEMENT

This **PATENT ASSIGNMENT** (this “Assignment”), effective as of August 1, 2020, (the “Effective Date”), is entered into by and between **Cray Inc.**, a corporation organized under the laws of State of Washington, United States of America, with principal office and place of business at 901 Fifth Ave., Suite 1000, Seattle, WA, 98164, United States of America (hereinafter “Assignor”), and **Hewlett Packard Enterprise Development LP**, a limited partnership organized under the laws of Texas, with a principal office and place of business at 11445 Compaq Center Drive West, Houston, TX 77707, United States of America (hereinafter “Assignee”). Assignor and Assignee are referred to herein individually as a “Party” and collectively as the “Parties”.

RECITALS

WHEREAS, Assignor and Assignee are parties to that certain *Intellectual Property Assignment and Acknowledgment Agreement*, dated the August 1, 2020, pursuant to which Assignor assigned and transferred to Assignee all legal title and legal ownership in and to Assignor’s intellectual property, including the patents and patent applications scheduled in Exhibit A (“Patents”), and Assignee desires to record such transfer and assignment.

WHEREAS, the Parties wish to record such acquisition.

NOW, THEREFORE, for good and valuable consideration, the adequacy of which is hereby acknowledged, the Parties agree as follows:

1. Assignor shall assign and does hereby assigns to Assignee all legal title and legal ownership in and to the Patents, including, without limitation, the right (where applicable) to file applications under the Paris Convention corresponding to or based on any of the applications for the Patents and to claim priority from such applications and to file national phase, regional phase, continuation, continuation-in-part and divisional applications based on the Patents.
2. Assignor hereby authorizes and requests the competent authorities to record this Assignment and to grant and issue any and all registrations of the Patents throughout the world to Assignee, its successors, or assigns, whose rights, title, and interests in such registrations are the same as would have been held and enjoyed by Assignor had this Assignment not been made.
3. Assignor will, and will ensure that any other necessary party will, execute all such documents and do all such acts and things as may be required by Assignee for securing and perfecting the assignment of the Patents in accordance with this Assignment.
4. This Assignment will be binding upon the Parties and their successors and assigns.
5. This Assignment may be executed simultaneously in two or more counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument. This Assignment may be executed by facsimile or .pdf signature, and a facsimile or .pdf signature will constitute an original for all purposes.

IN WITNESS WHEREOF, the Parties have executed this Assignment by their duly authorized representatives as of the Effective Date:

Cray Inc.

By: J-K Cox
(Signature)
Jeremy K. Cox
(Name)
Director
(Title)
Jul 30, 2020
(Execution Date)

Hewlett Packard Enterprise Development LP
By: Enterprise DC Holdings LLC, its General Partner

By: Sergio E. Letelier
(Signature)
Sergio E. Letelier
(Name)
Manager
(Title)
Jul 31, 2020
(Execution Date)

EXHIBIT A

PATENTS

Global ID	Patent No.	Publication Number	Application Number	Filed Date	Country	Patent Application Title
GCRAY0001			16/714347	2019-12-13	United States of America	SYSTEM AND METHOD FOR MODEL PARAMETER OPTIMIZATION
GCRAY0002			16/805517	2020-02-28	United States of America	Asymmetric Differential via Stubs for Skew Compensation
GCRAY0004		1020180065002	1020170166892	2017-12-06	Korea, Republic of (KR)	PCB TRANSMISSION LINES HAVING REDUCED LOSS
GCRAY0004		1256986	18115955.1	2017-12-05	Hong Kong	PCB TRANSMISSION LINES HAVING REDUCED LOSS
GCRAY0004		2018093203	2017-234134	2017-12-06	Japan	PCB TRANSMISSION LINES HAVING REDUCED LOSS
GCRAY0004		201834513	106142568	2017-12-05	Taiwan	PCB TRANSMISSION LINES HAVING REDUCED LOSS
GCRAY0004		20180160526	15/370498	2016-12-06	United States of America	PCB TRANSMISSION LINES HAVING REDUCED LOSS
GCRAY0004		3334259	17205368.8	2017-12-05	European Patent	PCB TRANSMISSION LINES HAVING REDUCED LOSS
GCRAY0005	10554519	20170230259	15/018823	2016-02-08	United States of America	SYSTEM AND METHOD FOR DAMPENING POWER SWINGS IN DISTRIBUTED COMPUTER ENVIRONMENTS
GCRAY0006	9577918	20140140341	13/681058	2012-11-19	United States of America	INCREASINGLY MINIMAL BIAS ROUTING (IMB)
GCRAY0006	10142235	20170163535	15/437201	2017-02-20	United States of America	INCREASINGLY MINIMAL BIAS ROUTING
GCRAY0006		20190109790	16/197159	2018-11-20	United States of America	INCREASINGLY MINIMAL BIAS ROUTING

GCRAY0007	7890673	20070088932	11/611092	2006-12-14	United States of America	SYSTEM AND METHOD FOR ACCESSING NON PROCESSOR ADDRESSABLE MEMORY
GCRAY0019	8832014	20130346354	13/529672	2012-06-21	United States of America	FORWARD INFERENCING OF FACTS IN PARALLEL
GCRAY0019	10296834	20140351195	14/458509	2014-08-13	United States of America	FORWARD INFERENCING OF FACTS IN PARALLEL
GCRAY0020	9047333	20140081934	13/623688	2012-09-20	United States of America	DYNAMIC UPDATES TO A SEMANTIC DATABASE USING FINE-GRAIN LOCKING
GCRAY0020		20150227570	14/693534	2015-04-22	United States of America	DYNAMIC UPDATES TO A SEMANTIC DATABASE USING FINE-GRAIN LOCKING
GCRAY0021		20160110174	14/978211	2015-12-22	United States of America	ASSISTING PARALLELIZATION OF A COMPUTER PROGRAM
GCRAY0021	9250877	20150089468	14/033306	2013-09-20	United States of America	ASSISTING PARALLELIZATION OF A COMPUTER PROGRAM
GCRAY0022	9372938	20130346445	13/529696	2012-06-21	United States of America	AUGMENTING QUERIES WHEN SEARCHING A SEMANTIC DATABASE
GCRAY0022		20160217189	15/090754	2016-04-05	United States of America	AUGMENTING QUERIES WHEN SEARCHING A SEMANTIC DATABASE
GCRAY0023	9910731	20170068596	15/357448	2016-11-21	United States of America	RESILIENCY TO MEMORY FAILURES IN COMPUTER SYSTEMS
GCRAY0023		20190243710	16/385448	2019-04-16	United States of America	RESILIENCY TO MEMORY FAILURES IN COMPUTER SYSTEMS
GCRAY0023	10324792	20170286240	15/625957	2017-06-16	United States of America	RESILIENCY TO MEMORY FAILURES IN COMPUTER SYSTEMS
GCRAY0023	9535804	20130311823	13/476819	2012-05-21	United States of America	RESILIENCY TO MEMORY FAILURES IN COMPUTER SYSTEMS

GCRAY0023	10127109	20170308430	15/625985	2017-06-16	United States of America	RESILIENCY TO MEMORY FAILURES IN COMPUTER SYSTEMS
GCRAY0024	10303610	20190042435	15/913749	2018-03-06	United States of America	HIGH-BANDWIDTH PREFETCHER FOR HIGH-BANDWIDTH MEMORY
GCRAY0024	9946654	20180074963	15/335041	2016-10-26	United States of America	HIGH-BANDWIDTH PREFETCHER FOR HIGH-BANDWIDTH MEMORY
GCRAY0025	10698813	20180322064	16/034216	2018-07-12	United States of America	MEMORY ALLOCATION SYSTEM FOR MULTI-TIER MEMORY
GCRAY0025	10185659	20180165209	15/374114	2016-12-09	United States of America	MEMORY ALLOCATION SYSTEM FOR MULTI-TIER MEMORY
GCRAY0048	7020767	20020038332	09/792426	2001-02-23	United States of America	TECHNIQUES FOR REDUCING THE RATE OF INSTRUCTION ISSUANCE
GCRAY0049	10595394		16/407721	2019-05-09	United States of America	PCB WITH MINIMIZED CROSSTALK
GCRAY0050	7428727	20050034024	10/937688	2004-09-09	United States of America	DEBUGGING TECHNIQUES IN A MULTITHREADED ENVIRONMENT
GCRAY0051	7426732	20040078795	10/683774	2003-10-10	United States of America	PLACING A TASK OF A MULTITHREADED ENVIRONMENT IN A KNOWN STATE
GCRAY0051	7536690	20040064818	10/663895	2006-09-16	United States of America	DEFERRED TASK SWAPPING IN A MULTITHREADED ENVIRONMENT
GCRAY0051	7392525	20040064816	10/676680	2003-10-01	United States of America	INTER-THREAD LONG JUMPS IN A MULTITHREADED ENVIRONMENT
GCRAY0051	7360221	20040088711	10/659407	2003-09-10	United States of America	TASK SWAP OUT IN A MULTITHREADED ENVIRONMENT

GCRAY0052	7558889	20040093605	10/697890	2003-10-30	United States of America	ACCESSING A COLLECTION OF DATA ITEMS IN A MULTITHREADED ENVIRONMENT
GCRAY0052	7558910	20050021898	10/697128	2003-10-30	United States of America	DETECTING ACCESS TO A MEMORY LOCATION IN A MULTITHREADED ENVIRONMENT
GCRAY0052	7904685		10/461979	2003-06-12	United States of America	SYNCHRONIZATION TECHNIQUES IN A MULTITHREADED ENVIRONMENT
GCRAY0056	7739667	20060101416	11/254232	2005-10-19	United States of America	PARALLELISM PERFORMANCE ANALYSIS BASED ON EXECUTION TRACE INFORMATION
GCRAY0076	6796370		09/705367	2000-11-03	United States of America	SEMICONDUCTOR CIRCULAR AND RADIAL FLOW COOLER
GCRAY0077	6641406		09/705368	2000-11-03	United States of America	FLEXIBLE CONNECTOR FOR HIGH DENSITY CIRCUIT APPLICATIONS
GCRAY0082	6525935	20020126449	09/804559	2001-03-12	United States of America	LOW PROFILE HIGHLY ACCESSIBLE COMPUTER ENCLOSURE WITH PLENUM FOR COOLING HIGH POWER PROCESSORS
GCRAY0086	6580609	20020135981	10/118279	2002-04-08	United States of America	METHOD AND APPARATUS FOR COOLING ELECTRONIC COMPONENTS
GCRAY0091	7587305	20040002846	10/180265	2002-06-26	United States of America	TRANSISTOR LEVEL VERILOG
GCRAY0092	6789249	20040003367	10/185177	2002-06-28	United States of America	BOOLEAN GATE DEFINITION
GCRAY0093	6922766	20040044872	10/235898	2002-09-04	United States of America	REMOTE TRANSLATION MECHANISM FOR A MULTI-NODE SYSTEM

GCRAY0095	7082500	20040162949	10/368090	2003-02-18	United States of America	OPTIMIZED HIGH BANDWIDTH CACHE COHERENCE MECHANISM
GCRAY0095	7409505	20060248286	11/456781	2006-07-11	United States of America	OPTIMIZED HIGH BANDWIDTH CACHE COHERENCE MECHANISM
GCRAY0096	7366873		10/643574	2003-08-18	United States of America	INDIRECTLY ADDRESSED VECTOR LOAD-OPERATRE-STORE METHOD AND APPARATUS
GCRAY0097	6992515		10/643576	2003-08-18	United States of America	CLOCK SIGNAL DUTY CYCLE ADJUST CIRCUIT
GCRAY0098	7519771		10/643577	2003-08-18	United States of America	SYSTEM AND METHOD FOR PROCESSING MEMORY INSTRUCTIONS USING A FORCED ORDER QUEUE
GCRAY0100	7735088		10/643587	2003-08-18	United States of America	SCHEDULING SYNCHRONIZATION OF PROGRAMS RUNNING AS STREAMS ON MULTI-PROCESSORS
GCRAY0101	7529906	20050044339	10/643588	2003-08-18	United States of America	SHARING MEMORY WITHIN AN APPLICATION USING SCALABLE HARDWARE RESOURCES
GCRAY0102	7421565		10/643727	2003-08-18	United States of America	METHOD AND APPARATUS FOR INDIRECTLY ADDRESSED VECTOR LOAD-ADD-STORE ACROSS MULTI-PROCESSORS
GCRAY0102	7793073	20070283127	11/771931	2007-06-29	United States of America	METHOD AND APPARATUS FOR INDIRECTLY ADDRESSED VECTOR LOAD-ADD-STORE ACROSS MULTI-PROCESSORS
GCRAY0103	6959342		10/643739	2003-08-18	United States of America	REPLICATING KERNEL DATA THAT IS READ MOSTLY AND WRITE RARELY

GCRAY0104	8296771	20050044547	10/643740	2003-08-18	United States of America	SYSTEM AND METHOD FOR MAPPING BETWEEN RESOURCE CONSUMERS AND RESOURCE PROVIDERS IN A COMPUTING SYSTEM
GCRAY0105	7743223	20050044128	10/643742	2003-08-18	United States of America	DECOUPLING OF WRITE ADDRESS FROM ITS ASSOCIATED WRITE DATA IN A STORE TO A SHARED MEMORY IN A MULTIPROCESSOR SYSTEM
GCRAY0105	7577816	20050044340	10/643758	2003-08-18	United States of America	REMOTE TRANSLATION MECHANISM FOR A MULTINODE SYSTEM
GCRAY0105	8307194		10/643754	2003-08-18	United States of America	RELAXED MEMORY CONSISTENCY MODEL
GCRAY0105	7437521		10/643741	2003-08-18	United States of America	MULTISTREAM PROCESSING MEMORY-AND-BARRIER-SYNCHRONIZATION METHOD AND APPARATUS
GCRAY0106	8924654		10/643744	2003-08-18	United States of America	MULTI-STREAMED PROCESSOR VECTOR PACKING METHOD AND APPARATUS
GCRAY0107	7475220		10/643765	2003-08-18	United States of America	BUFFER OVERFLOW DETECTION
GCRAY0108	7503048		10/643769	2003-08-18	United States of America	SCHEDULING SYNCHRONIZATION OF PROGRAMS RUNNING AS STREAMS ON MULTIPLE PROCESSORS
GCRAY0110	6997741	20050105280	10/713170	2003-11-15	United States of America	SYSTEMS AND METHODS FOR PARTITIONING BANKS OF PROCESSORS IN LARGE COMPUTER SYSTEMS

GCRAY0110	7533460	20060105627	11/314520	2005-12-21	United States of America	METHOD FOR PARTITIONING BANKS OF PROCESSORS IN LARGE COMPUTER SYSTEMS
GCRAY0110	7059899	20060099852	11/313310	2005-12-21	United States of America	SYSTEMS AND METHODS FOR PARTITIONING BANKS OF PROCESSORS IN LARGE COMPUTER SYSTEMS
GCRAY0113	7330350	20050270738	10/862031	2004-06-04	United States of America	SYSTEMS AND METHODS FOR COOLING COMPUTER MODULES IN COMPUTER CABINETS
GCRAY0114	7120027	20060007660	10/886895	2004-07-08	United States of America	ASSEMBLIES FOR MOUNTING ELECTRONIC DEVICES AND ASSOCIATED HEAT SINKS TO COMPUTER MODULES AND OTHER STRUCTURES
GCRAY0123	7757497		12/356020	2009-01-19	United States of America	METHOD AND APPARATUS FOR COOLING ELECTRONIC COMPONENTS
GCRAY0124	7630198	20070211428	11/371272	2006-03-08	United States of America	MULTI-STAGE AIR MOVERS FOR COOLING COMPUTER SYSTEMS AND FOR OTHER USES
GCRAY0126	7411785	20070279861	11/447469	2006-06-05	United States of America	HEAT-SPREADING DEVICES FOR COOLING COMPUTER SYSTEMS AND ASSOCIATED METHODS OF USE
GCRAY0128	7751519	20080285598	11/748368	2007-05-14	United States of America	PHASE ROTATOR FOR DELAY LOCKED LOOP BASED SERDES
GCRAY0132	8413126	20080313621	11/763990	2007-06-15	United States of America	SCALAR CODE REDUCTION USING SHORTEST PATH ROUTING
GCRAY0134	9596789	20140333187	14/444985	2014-07-28	United States of America	COOLING SYSTEMS AND HEAT EXCHANGERS FOR COOLING COMPUTER COMPONENTS

GCRAY0134	10082845	20170177042	15/420863	2017-01-31	United States of America	COOLING SYSTEMS AND HEAT EXCHANGERS FOR COOLING COMPUTER COMPONENTS
GCRAY0134	9288935	20140251574	14/283299	2014-05-21	United States of America	COOLING SYSTEMS AND HEAT EXCHANGERS FOR COOLING COMPUTER COMPONENTS
GCRAY0134	8820395	20100317279	12/862002	2010-08-24	United States of America	COOLING SYSTEMS AND HEAT EXCHANGERS FOR COOLING COMPUTER COMPONENTS
GCRAY0135	10588246	20160330875	15/213131	2016-07-18	United States of America	SYSTEMS AND ASSOCIATED METHODS FOR CONTROLLABLY COOLING COMPUTER COMPONENTS
GCRAY0135	9420729	20120188706	13/438735	2012-04-03	United States of America	SYSTEMS AND ASSOCIATED METHODS FOR CONTROLLABLY COOLING COMPUTER COMPONENTS
GCRAY0135	8170724	20090201644	12/029124	2008-02-11	United States of America	SYSTEMS AND ASSOCIATED METHODS FOR CONTROLLABLY COOLING COMPUTER COMPONENTS
GCRAY0136	7957412	20090238257	12/051674	2008-03-19	United States of America	LONELY PULSE COMPENSATION
GCRAY0137	7898799	20090244826	12/060377	2008-04-01	United States of America	AIRFLOW MANAGEMENT APPARATUS FOR COMPUTER CABINETS AND ASSOCIATED METHODS
GCRAY0139	8654489	20120176711	13/175387	2011-07-01	United States of America	METHOD AND APPARATUS FOR SWITCHED ELECTROSTATIC DISCHARGE PROTECTION
GCRAY0139	7974052	20090268358	12/109679	2008-04-25	United States of America	METHOD AND APPARATUS FOR SWITCHED ELECTROSTATIC DISCHARGE PROTECTION

GCRAY0140	8316075	20090292900	12/124796	2008-05-21	United States of America	MULTIPROCESSOR NODE CONTROL TREE
GCRAY0142	7966591	20100095255	12/248765	2008-10-06	United States of America	SYSTEM AND METHOD FOR VERIFYING RACE-DRIVEN REGISTERS
GCRAY0143	8081459	20100097751	12/253672	2008-10-17	United States of America	AIR CONDITIONING SYSTEMS FOR COMPUTER SYSTEMS AND ASSOCIATED METHODS
GCRAY0143	8537539	20120008275	13/211386	2011-08-17	United States of America	AIR CONDITIONING SYSTEMS FOR COMPUTER SYSTEMS AND ASSOCIATED METHODS
GCRAY0144	7903403	20100097752	12/253692	2008-10-17	United States of America	AIRFLOW INTAKE SYSTEMS AND ASSOCIATED METHODS FOR USE WITH COMPUTER CABINETS
GCRAY0145		20100115234	12/263302	2008-10-31	United States of America	CONFIGURABLE VECTOR LENGTH COMPUTER PROCESSOR
GCRAY0145	8601236	20120221830	13/409033	2012-02-29	United States of America	CONFIGURABLE VECTOR LENGTH COMPUTER PROCESSOR
GCRAY0146	8386750	20100115228	12/263321	2008-10-31	United States of America	MULTIPROCESSOR SYSTEM HAVING PROCESSORS WITH DIFFERENT ADDRESS WIDTHS AND METHOD FOR OPERATING THE SAME
GCRAY0151	8095759	20100306489	12/474556	2009-05-29	United States of America	ERROR MANAGEMENT FIREWALL IN A MULTIPROCESSOR COMPUTER
GCRAY0152	8954484	20100318591	12/814101	2010-06-11	United States of America	INCLUSIVE OR BIT MATRIX TO COMPARE MULTIPLE CORRESPONDING SUBFIELDS
GCRAY0152	8433883	20100318773	12/482618	2009-06-11	United States of America	INCLUSIVE "OR" BIT MATRIX COMPARE RESOLUTION OF VECTOR UPDATE CONFLICT MASKS

GCRAY0152	9547474	20140337398	14/337750	2014-07-22	United States of America	INCLUSIVE OR BIT MATRIX TO COMPARE MULTIPLE CORRESPONDING SUBFIELDS
GCRAY0153	8583898	20100318764	12/484062	2009-06-12	United States of America	SYSTEM AND METHOD FOR MANAGING PROCESSOR-IN-MEMORY (PIM) OPERATIONS
GCRAY0153	8826252	20100318769	12/483908	2009-06-12	United States of America	USING VECTOR ATOMIC MEMORY OPERATION TO HANDLE DATA OF DIFFERENT LENGTHS
GCRAY0154	8239704	20100318831	12/483886	2009-06-12	United States of America	GLOBAL CLOCK VIA EMBEDDED SPANNING TREE
GCRAY0158	8332596	20100318751	12/484164	2009-06-12	United States of America	MULTIPLE ERROR MANAGEMENT IN A MULTIPROCESSOR COMPUTER SYSTEM
GCRAY0160	8103643	20110153797	12/643340	2009-12-21	United States of America	SYSTEM AND METHOD FOR PERFORMING DISTRIBUTED TRANSACTIONS USING GLOBAL EPOCHS
GCRAY0162	5651521		2011-083529	2011-04-05	Japan	COMPUTER CABINETS HAVING PROGRESSIVE AIR VELOCITY COOLING SYSTEMS AND ASSOCIATED METHODS OF MANUFACTURE AND USE
GCRAY0162	9310856	20130229768	13/864423	2013-04-17	United States of America	COMPUTER CABINETS HAVING PROGRESSIVE AIR VELOCITY COOLING SYSTEMS AND ASSOCIATED METHODS OF MANUFACTURE AND USE
GCRAY0162	8472181	20110255237	12/763977	2010-04-20	United States of America	COMPUTER CABINETS HAVING PROGRESSIVE AIR VELOCITY COOLING SYSTEMS AND ASSOCIATED METHODS OF MANUFACTURE AND USE

GCRAY0163	8806436	20110271259	12/771432	2010-04-30	United States of America	SYSTEMS AND METHODS FOR DEBUGGING APPLICATIONS USING DUAL CODE GENERATION
GCRAY0163	9672133	20140325488	14/325463	2014-07-08	United States of America	SYSTEMS AND METHODS FOR DEBUGGING APPLICATIONS USING DUAL CODE GENERATION
GCRAY0164	9674091	20160277300	15/169986	2016-06-01	United States of America	CONGESTION CAUSATION IN A NETWORK INTERCONNECT
GCRAY0164	8885467	20120230188	13/044177	2011-03-09	United States of America	CONGESTION CAUSATION IN A NETWORK INTERCONNECT
GCRAY0164	9391899	20150139024	14/570722	2014-12-15	United States of America	CONGESTION DETECTION IN A NETWORK INTERCONNECT
GCRAY0164	8953442	20120230212	13/044099	2011-03-09	United States of America	CONGESTION DETECTION IN A NETWORK INTERCONNECT
GCRAY0165	8982688	20120230177	13/044139	2011-03-09	United States of America	CONGESTION ABATEMENT IN A NETWORK INTERCONNECT
GCRAY0165	9674092	20160277301	15/170277	2016-06-01	United States of America	CONGESTION ABATEMENT IN A NETWORK INTERCONNECT
GCRAY0165	9491101	20150180780	14/612553	2015-02-03	United States of America	CONGESTION ABATEMENT IN A NETWORK INTERCONNECT
GCRAY0167	9201689	20120272247	13/092822	2011-04-22	United States of America	SOFTWARE EMULATION OF MASSIVE HARDWARE THREADING FOR TOLERATING REMOTE MEMORY REFERENCES
GCRAY0168	8854951	20120287777	13/104778	2011-05-10	United States of America	DYNAMICALLY UPDATING ROUTING INFORMATION WHILE AVOIDING DEADLOCKS AND PRESERVING PACKET ORDER AFTER A LINK ERROR
GCRAY0168	9154400	20120287821	13/104799	2011-05-10	United States of America	DYNAMICALLY UPDATING ROUTING INFORMATION WHILE AVOIDING DEADLOCKS AND PRESERVING PACKET

								ORDER AFTER A CONFIGURATION CHANGE
GCRAY0170	5815186			2014-549049	2012-11-01	Japan		PRINTED CIRCUIT BOARD WITH REDUCED CROSS-TALK
GCRAY0170	101609496	1020140098251		1020147019169	2012-11-01	Korea, Republic of (KR)		PRINTED CIRCUIT BOARD WITH REDUCED CROSS-TALK
GCRAY0170	8885357	20130175077		13/345247	2012-01-06	United States of America		PRINTED CIRCUIT BOARD WITH REDUCED CROSS-TALK
GCRAY0171	9225780	20130226887		13/404618	2012-02-24	United States of America		DATA INTEGRITY IN A NETWORKED STORAGE SYSTEM
GCRAY0172	2505260	2505260		1223503.2	2012-12-31	United Kingdom		DATA STORAGE I/O COMMUNICATION METHOD AND APPARATUS
GCRAY0172	9130969	20140059551		13/593327	2012-08-23	United States of America		DATA STORAGE I/O COMMUNICATION METHOD AND APPARATUS
GCRAY0173	9311731	20150138206		14/570073	2014-12-15	United States of America		DYNAMIC GRAPH SYSTEM FOR A SEMANTIC DATABASE
GCRAY0173	8943068	20140244657		13/777884	2013-02-26	United States of America		DYNAMIC GRAPH SYSTEM FOR A SEMANTIC DATABASE
GCRAY0174	9015656	20140244968		13/781285	2013-02-28	United States of America		MAPPING VECTOR REPRESENTATIONS ONTO A PREDICATED SCALAR MULTI- THREADED SYSTEM
GCRAY0175	9032251	20140281663		13/797342	2013-03-12	United States of America		RE-FORMING AN APPLICATION CONTROL TREE WITHOUT TERMINATING THE APPLICATION
GCRAY0178		20190086987		16/136218	2018-09-19	United States of America		APPLICATION RAMP RATE CONTROL IN LARGE INSTALLATIONS

GCRAY0178	10216245	20170177070	14/978990	2015-12-22	United States of America	APPLICATION RAMP RATE CONTROL IN LARGE INSTALLATIONS
GCRAY0179		3361837	18155527.7	2018-02-07	European Patent	METHOD FOR IMPEDANCE COMPENSATION IN PRINTED CIRCUIT BOARDS
GCRAY0179	10154581	20180228019	15/428865	2017-02-09	United States of America	METHOD FOR IMPEDANCE COMPENSATION IN PRINTED CIRCUIT BOARDS
GCRAY0179		1020180092870	1020180015503	2018-02-08	Korea, Republic of (KR)	METHOD FOR IMPEDANCE COMPENSATION IN PRINTED CIRCUIT BOARDS
GCRAY0179		1259619	19101807.0	2018-02-07	Hong Kong	METHOD FOR IMPEDANCE COMPENSATION IN PRINTED CIRCUIT BOARDS
GCRAY0180		WO2020028207	PCT/US2019/043831	2019-07-28	Patent Cooperation Treaty	DIRECT CONNECTION OF HIGH SPEED SIGNALS ON PCB CHIP
GCRAY0180	10716213	20200037448	16/048267	2018-07-28	United States of America	DIRECT CONNECTION OF HIGH SPEED SIGNALS ON PCB CHIP
GCRAY0181			16/156732	2018-10-10	United States of America	COMPUTE ASSEMBLY FOR HIGH SPEED ULTRA DENSE COMPUTE BLADES
GCRAY0184	7826996	20080059105	11/679175	2007-02-26	United States of America	MEMORY-DAUGHTER-CARD-TESTING APPARATUS AND METHOD
GCRAY0184	8024638	20070101238	11/558450	2006-11-10	United States of America	APPARATUS AND METHOD FOR MEMORY READ-REFRESH, SCRUBBING AND VARIABLE-RATE REFRESH
GCRAY0184	8347176	20120246544	13/237676	2011-09-20	United States of America	METHOD AND APPARATUS FOR MEMORY READ-REFRESH, SCRUBBING AND VARIABLE-RATE REFRESH
GCRAY0184	7676728	20070113150	11/558452	2006-11-10	United States of America	APPARATUS AND METHOD FOR MEMORY

GCRAY0185	7071736	20040233752	10/848690	2004-05-17	United States of America	ASYNCHRONOUS ATOMIC READ-CORRECT-WRITE OPERATION
GCRAY0187	7984453	20080134213	11/857261	2007-09-18	United States of America	HALF-SWING LINE PRECHARGE METHOD AND APPARATUS
GCRAY0189	7304842	20050286230	11/153847	2005-06-14	United States of America	EVENT NOTIFICATIONS RELATING TO SYSTEM FAILURES IN SCALABLE SYSTEMS
GCRAY0190	7764629	20060034194	11/201765	2005-08-11	United States of America	APPARATUSES AND METHODS FOR COOLING ELECTRONIC DEVICES IN COMPUTER SYSTEMS
GCRAY0191	7362571	20060068695	11/227832	2005-09-15	United States of America	IDENTIFYING CONNECTED COMPONENTS OF A GRAPH IN PARALLEL
GCRAY0195	7624246	20070100916	11/584173	2006-10-20	United States of America	INLET FLOW CONDITIONERS FOR COMPUTER CABINET AIR CONDITIONING SYSTEMS
GCRAY0196	8286135	20080092121	11/874017	2007-10-17	United States of America	METHOD AND SYSTEM FOR MEMORY ALLOCATION IN A MULTIPROCESSING ENVIRONMENT
GCRAY0197	8065573	20090177932	12/274044	2008-11-19	United States of America	PERFORMANCE VISUALIZATION INCLUDING HIERARCHICAL DISPLAY OF PERFORMANCE DATA
GCRAY0197	8464007	20090287889	12/484075	2009-06-12	United States of America	METHOD AND APPARATUS FOR TRACKING, REPORTING AND CORRECTING SINGLE-BIT MEMORY ERRORS
GCRAY0197	8245087	20100185897	11/693572	2007-03-29	United States of America	READ/WRITE CLUSTERING SYSTEMS AND METHODS
						MULTI-BIT MEMORY ERROR MANAGEMENT

GCRAY0200	8402465	20110125992	12/692853	2010-01-25	United States of America	SYSTEM TOOL PLACEMENT IN A MULTIPROCESSOR COMPUTER
GCRAY0202	8762536	20120198470	13/361551	2012-01-30	United States of America	COMPACT NODE ORDERED APPLICATION PLACEMENT IN A MULTIPROCESSOR COMPUTER
GCRAY0206	10034416	20160044828	14/887275	2012-11-19	United States of America	TRANSVERSE COOLING SYSTEM AND METHOD
GCRAY0206	9167726	20130128459	13/681188	2012-11-19	United States of America	TRAVERSE COOLING SYSTEM AND METHOD
GCRAY0206	9185828	20130301219	13/836873	2013-03-15	United States of America	RACK MOUNTED ELECTRONICS HAVING CONNECTORS WITH HEAT COOLING FINGERS
GCRAY0208	9294551		13/798082	2013-03-13	United States of America	COLLECTIVE ENGINE METHOD AND APPARATUS
GCRAY0208	10129329	20160077997	14/881157	2015-10-13	United States of America	APPARATUS AND METHOD FOR DEADLOCK AVOIDANCE
GCRAY0208	9160607		13/798074	2013-03-12	United States of America	METHOD AND APPARATUS FOR DEADLOCK AVOIDANCE
GCRAY0210			16/499209	2018-03-27	United States of America	FLEXIBLE AND ADAPTABLE COMPUTING SYSTEM INFRASTRUCTURE
GCRAY0211			16/880944	2020-05-21	United States of America	SKEW COMPENSATION APPARATUS FOR CONTROLLING TRANSMISSION LINE IMPEDANCE
GCRAY0212			16/882146	2020-05-22	United States of America	A METHOD FOR CROSS-TALK REDUCTION TECHNIQUE WITH FINE PITCH VIAS
GCRAY0219	9830206	20150169388	14/133384	2013-12-18	United States of America	CROSS-THREAD EXCEPTION HANDLING
GCRAY0220	10657178	20160055261	14/466868	2014-08-22	United States of America	USER-CONTROLLED GRAPH ANALYSIS SYSTEM

GCRAY0227			62/405531	2016-10-07	United States of America	HIGH-BANDWIDTH PREFETCHER FOR HIGH-BANDWIDTH MEMORY
GCRAY0228			PCT/US2020/024 241	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT PACKET FORWARDING USING A MESSAGE STATE TABLE IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 311	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT MESSAGE MATCHING IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 246	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING HYBRID MESSAGE MATCHING IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 254	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING DATA REQUEST MANAGEMENT IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 272	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT LOAD BALANCING IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 332	2020-03-23	Patent Cooperation Treaty	METHOD AND SYSTEM FOR FACILITATING WIDE LAG AND ECMP CONTROL
GCRAY0228			PCT/US2020/024 324	2020-03-23	Patent Cooperation Treaty	METHOD AND SYSTEM FOR FACILITATING LOSSY DROPPING AND ECN MARKING

GCRAY0228			PCT/US2020/024 253	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING TRACER PACKETS IN A DATA-DRIVEN INTELLIGENT NETWORK
GCRAY0228			PCT/US2020/024 245	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING FINE-GRAIN FLOW CONTROL IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 271	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT ADDRESS TRANSLATION IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 258	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT HOST MEMORY ACCESS FROM A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 321	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT PACKET INJECTION INTO AN OUTPUT BUFFER IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 244	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING ON-DEMAND PAGING IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 267	2020-03-23	Patent Cooperation Treaty	SWITCH DEVICE FOR FACILITATING SWITCHING IN DATA-DRIVEN INTELLIGENT NETWORK

GCRAY0228			PCT/US2020/024 256	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT MANAGEMENT OF IDEMPOTENT OPERATIONS IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 262	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT PACKET FORWARDING IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 250	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING DYNAMIC COMMAND MANAGEMENT IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 304	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT MANAGEMENT OF NON- IDEMPOTENT OPERATIONS IN A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 248	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT EVENT NOTIFICATION MANAGEMENT FOR A NETWORK INTERFACE CONTROLLER (NIC)
GCRAY0228			PCT/US2020/024 257	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING OPERATION MANAGEMENT IN A NETWORK INTERFACE CONTROLLER (NIC) FOR ACCELERATORS
GCRAY0228			PCT/US2020/024 242	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING EFFICIENT UTILIZATION OF AN OUTPUT

GCRAY0228				PCT/US2020/024 243	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING SELF- MANAGING REDUCTION ENGINES
GCRAY0228				PCT/US2020/024 170	2020-03-23	Patent Cooperation Treaty	OPTIMIZED ADAPTIVE ROUTING TO REDUCE NUMBER OF HOPS
GCRAY0228				PCT/US2020/024 158	2020-03-23	Patent Cooperation Treaty	DRAGONFLY ROUTING WITH INCOMPLETE GROUP CONNECTIVITY
GCRAY0228				PCT/US2020/024 192	2020-03-23	Patent Cooperation Treaty	FAT TREE ADAPTIVE ROUTING
GCRAY0228				PCT/US2020/024 276	2020-03-23	Patent Cooperation Treaty	DEADLOCK-FREE MULTICAST ROUTING ON A DRAGONFLY NETWORK
GCRAY0228				PCT/US2020/024 221	2020-03-23	Patent Cooperation Treaty	WEIGHTING ROUTING
GCRAY0228				PCT/US2020/024 340	2020-03-23	Patent Cooperation Treaty	SYSTEMS AND METHODS FOR PER TRAFFIC CLASS ROUTING
GCRAY0228				PCT/US2020/024 303	2020-03-23	Patent Cooperation Treaty	SYSTEMS AND METHODS FOR ADAPTIVE ROUTING IN THE PRESENCE OF PERSISTENT FLOWS
GCRAY0228				PCT/US2020/024 125	2020-03-23	Patent Cooperation Treaty	METHODS FOR DISTRIBUTING SOFTWARE-DETERMINED GLOBAL LOAD INFORMATION
GCRAY0228				PCT/US2020/024 342	2020-03-23	Patent Cooperation Treaty	SYSTEMS AND METHODS FOR ON THE FLY ROUTING IN THE PRESENCE OF ERRORS

GCRAY0228			PCT/US2020/024 129	2020-03-23	Patent Cooperation Treaty	ALGORITHMS FOR USE OF LOAD INFORMATION FROM NEIGHBORING NODES IN ADAPTIVE ROUTING
GCRAY0228			PCT/US2020/024 259	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING DATA-DRIVEN INTELLIGENT NETWORK
GCRAY0228			PCT/US2020/024 339	2020-03-23	Patent Cooperation Treaty	METHOD AND SYSTEM FOR PROVIDING NETWORK INGRESS FAIRNESS BETWEEN APPLICATIONS
GCRAY0228			PCT/US2020/024 266	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING GLOBAL FAIRNESS IN A NETWORK
GCRAY0228			PCT/US2020/024 237	2020-03-23	Patent Cooperation Treaty	METHOD AND SYSTEM FOR PROVIDING NETWORK EGRESS FAIRNESS BETWEEN APPLICATIONS
GCRAY0228			PCT/US2020/024 260	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR DYNAMIC ALLOCATION OF REDUCTION ENGINES
GCRAY0228			PCT/US2020/024 269	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR PERFORMING ON-THE-FLY REDUCTION IN A NETWORK
GCRAY0228			PCT/US2020/024 268	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING DATA-DRIVEN INTELLIGENT NETWORK WITH PER-FLOW CREDIT-BASED FLOW CONTROL
GCRAY0228			PCT/US2020/024 251	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING DATA-DRIVEN INTELLIGENT NETWORK WITH ENDPOINT CONGESTION DETECTION AND CONTROL

GCRAY0228			PCT/US2020/024 270	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING DATA-DRIVEN INTELLIGENT NETWORK WITH FLOW CONTROL OF INDIVIDUAL APPLICATIONS AND TRAFFIC FLOWS
GCRAY0228			PCT/US2020/024 239	2020-03-23	Patent Cooperation Treaty	DYNAMIC BUFFER MANAGEMENT IN DATA- DRIVEN INTELLIGENT NETWORK
GCRAY0228			PCT/US2020/024 327	2020-03-23	Patent Cooperation Treaty	SYSTEM AND METHOD FOR FACILITATING DATA-DRIVEN INTELLIGENT NETWORK WITH INGRESS PORT INJECTION LIMITS