

## PATENT ASSIGNMENT COVER SHEET

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 Stylesheet Version v1.2

EPAS ID: PAT4708941

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	PATENT SECURITY AGREEMENT (NOTES)
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
DELL PRODUCTS L.P.	11/28/2017
EMC CORPORATION	11/28/2017
EMC IP HOLDING COMPANY LLC	11/28/2017
WYSE TECHNOLOGY L.L.C.	11/28/2017
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., AS COLLATERAL AGENT
<b>Street Address:</b>	601 TRAVIS STREET
<b>Internal Address:</b>	16TH FLOOR
<b>City:</b>	HOUSTON
<b>State/Country:</b>	TEXAS
<b>Postal Code:</b>	77002
<b>PROPERTY NUMBERS Total: 350</b>	
<b>Property Type</b>	<b>Number</b>
Patent Number:	9734106
Patent Number:	9758277
Patent Number:	9763021
Patent Number:	9807641
Patent Number:	9734674
Patent Number:	9740632
Patent Number:	9747164
Patent Number:	9755938
Patent Number:	9766990
Patent Number:	9798334
Patent Number:	9798472
Patent Number:	9727573
Patent Number:	9733989
Patent Number:	9734074
Patent Number:	9736007
Patent Number:	9740565
<b>PATENT</b>	

Property Type	Number
Patent Number:	9740844
Patent Number:	9740880
Patent Number:	9747040
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Patent Number:	9804797
Patent Number:	9804934
Patent Number:	9807165
Patent Number:	9762440
Application Number:	15670377
Application Number:	15672066
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Application Number:	15803303
Application Number:	15803468
Application Number:	15716325
Application Number:	62553364
Application Number:	62555733
Application Number:	62569158

#### **CORRESPONDENCE DATA**

**Fax Number:** (650)251-5002

*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:** (650) 251-5106

**Email:** jnull@stblaw.com

**Correspondent Name:** AMBER HAREZLAK

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**Address Line 4:** PALO ALTO, CALIFORNIA 94304

**PATENT**

**REEL: 044535 FRAME: 0118**

<b>ATTORNEY DOCKET NUMBER:</b>	001909/0002
<b>NAME OF SUBMITTER:</b>	J. JASON MULL
<b>SIGNATURE:</b>	/J. Jason Mull/
<b>DATE SIGNED:</b>	11/29/2017

**Total Attachments: 22**

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PATENT SECURITY AGREEMENT dated as of November 28, 2017 (this “Agreement”) by Dell Products L.P., a Texas limited partnership, EMC Corporation, a Massachusetts Corporation (“EMC”), EMC IP Holding Company LLC, a Delaware limited liability company and Wyse Technology L.L.C., a Delaware limited liability company (each, a “Grantor” and collectively, the “Grantors”) in favor of The Bank of New York Mellon Trust Company, N.A., as Collateral Agent (in such capacity, the “Notes Collateral Agent”).

Reference is made to (a) the Indenture dated as of June 1, 2016 among Diamond 1 Finance Corporation, a Delaware corporation (“Finco 1”, which, in connection with the Dell-EMC Merger, has merged with and into Dell International, with Dell International continuing as the surviving corporation and which, following the consummation of the Dell-EMC Merger, on or about the Business Day following the Effective Date, will merge with and into New Dell International LLC, a Delaware limited liability company (“New Dell International”), with New Dell International continuing as the surviving corporation), Diamond 2 Finance Corporation, a Delaware corporation (“Finco 2”, which, in connection with the Dell-EMC Merger, has merged with and into EMC, with EMC continuing as the surviving corporation), and The Bank of New York Mellon Trust Company, N.A., in its capacity as Trustee on behalf of the holders (the “Holders”) of the Notes (as defined below) and Notes Collateral Agent (as from time to time amended, restated, supplemented or otherwise modified, the “Indenture”) and (b) the Security Agreement dated as of September 7, 2016 (as amended, supplemented or otherwise modified from time to time, the “Security Agreement”) among the Issuers, the other grantors from time to time party thereto and the Notes Collateral Agent. The Grantors are Affiliates of the Issuers, and will derive substantial benefits from the execution, delivery and performance of the obligations under the Indenture and the Notes and each is, therefore, willing to enter into this Agreement. Accordingly, the parties hereto agree as follows:

SECTION 1. Terms. Capitalized terms used in this Agreement and not otherwise defined herein have the meanings specified in the Security Agreement or the Indenture, as applicable. The rules of construction specified in Section 1.01(b) of the Security Agreement also apply to this Agreement.

SECTION 2. Grant of Security Interest. As security for the payment or performance, as the case may be, in full of the Secured Obligations, each Grantor hereby grants to the Notes Collateral Agent, its successors and assigns, for the benefit of the Secured Parties, a security interest (the “Security Interest”) in all of such Grantor’s right, title and interest in, to and under any Patents now owned or at any time hereafter acquired by such Grantor, including those listed on Schedule I (the “Patent Collateral”).

SECTION 3. Security Agreement. The Security Interest granted to the Notes Collateral Agent herein is granted in furtherance, and not in limitation, of the security interests granted to the Notes Collateral Agent pursuant to the Security Agreement. Each Grantor hereby acknowledges and affirms that the rights and remedies of the Notes Collateral Agent with respect to the Patent Collateral are more fully set forth in the Security Agreement, the terms and provisions of which are hereby incorporated herein by reference as if fully set forth herein. In the event of any conflict between the terms of this Agreement and the Security Agreement, the terms of the Security Agreement shall govern.

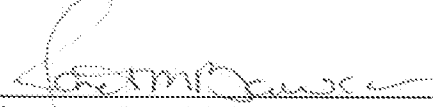
SECTION 4. Counterparts. This Agreement may be executed in counterparts (and by different parties hereto on different counterparts), each of which shall constitute an original but all of which when taken together shall constitute a single contract. Delivery of an executed signature page to this Agreement by facsimile or other electronic transmission shall be effective as delivery of a manually signed counterpart of this Agreement.

SECTION 5. Governing Law. This Agreement shall be construed in accordance with and governed by the law of the State of New York.

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IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of the day and year first above written.

DELL PRODUCTS L.P.  
EMC CORPORATION  
EMC IP HOLDING COMPANY LLC  
WYSE TECHNOLOGY L.L.C.

By:   
Name: Janet M. Bawcom  
Title: Sr. Vice President & Assistant Secretary

## Schedule I

## U.S. Patent Applications

Owner	Title	Date	Application No.
Dell Products L.P.	TESTING MODULE COMPATIBILITY	8/7/2017	15/670,377
Dell Products L.P.	SYSTEM AND METHOD OF MANAGING A MEMORY MEDIUM	8/8/2017	15/672,066
Dell Products L.P.	METHOD AND SYSTEM TO AVOID TEMPORARY TRAFFIC LOSS WITH BGP ETHERNET VPN MULTI-HOMING WITH DATA-PLANE MAC ADDRESS LEARNING	8/8/2017	15/672,164
Dell Products L.P.	SYSTEMS AND METHOD FOR MAPPING SYSTEMS IN A SERVER RACK BASED ON NEIGHBORING SYSTEMS	8/9/2017	15/672,998
Dell Products L.P.	RESETTING SYSTEM REGISTERS POWERED BY INDEPENDENT POWER SOURCE	8/10/2017	15/674,049
Dell Products L.P.	COMPOSITE CHASSIS WALL WITH WIRELESS TRANSMISSION WINDOW	8/10/2017	15/674,209
Dell Products L.P.	SYSTEMS AND METHODS FOR USAGE DRIVEN DETERMINATION OF UPDATE CRITICALITY	8/10/2017	15/674,279
Dell Products L.P.	METHOD OF MEMORY DEVICE FIRMWARE UPDATE OVER DDR	8/11/2017	15/675,272
Dell Products L.P.	CARRIER FOR STORAGE DRIVE	8/14/2017	15/676,243
Dell Products L.P.	SYSTEM AND METHOD FOR AUTOMATIC WIRELESS CONNECTIONS BETWEEN SERVER MANAGEMENT CONTROLLERS TO SET UP A SECURE PROXY CHANNEL	8/14/2017	15/676,292
Dell Products L.P.	THUNDERBOLT PCIE CABLE LESS ADD-IN CARD FORM FACTOR SOLUTION	8/15/2017	15/677,828
Dell Products L.P.	BATTERY MANAGEMENT USING BATTERY TEMPERATURE DISTRIBUTION	8/15/2017	15/677,988
Dell Products L.P.	METHOD OF CREATING THEMATIC AUGMENTED WORKSPACE	8/16/2017	15/678,937
Dell Products L.P.	STAGED SNAP HINGE WITH ADJUSTABILITY	8/22/2017	15/683,469
Dell Products L.P.	POWER OVER ETHERNET COOLING SYSTEM	8/22/2017	15/683,479
Dell Products L.P.	SYSTEM AND METHOD FOR GROUP POLICY BASED CONFIGURATION	8/24/2017	15/686,041
Dell Products L.P.	POWER STORAGE ADAPTER FOR EFFICIENT SUPPLY OF POWER OF MULTIPLE PORTABLE INFORMATION HANDLING SYSTEMS	8/24/2017	15/686,056
Dell Products L.P.	REPEATABLE BACKCHANNEL LINK ADAPTATION FOR HIGH SPEED SERIAL INTERFACES	8/28/2017	15/688,335
Dell Products L.P.	SYSTEM AND METHOD FOR ENABLING AND DISABLING OF BASEBOARD MANAGEMENT CONTROLLER	8/30/2017	15/691,128

Owner	Title	Date	Application No.
	CONFIGURATION LOCKDOWN		
Dell Products L.P.	METHOD FOR EXTENDING THE LIFE OF A DISCOUNTS AND COUPONS & PROMOTIONS IN AN ECOMMERCE PLATFORM	8/30/2017	15/691,325
Dell Products L.P.	MULTI-FUNCTIONAL FAN TRAY	8/30/2017	15/691,346
Dell Products L.P.	PRIORITIZING SUPPLYING ELECTRICAL POWER BY A POWER STORAGE ADAPTER TO CONNECTED DEVICES	9/1/2017	15/694,505
Dell Products L.P.	EFFICIENT CHARGING OF MULTIPLE PORTABLE INFORMATION HANDLING SYSTEMS BASED ON LEARNED CHARGING CHARACTERISTICS	9/1/2017	15/694,553
Dell Products L.P.	PERFORMANCE LIGHTING AND CONTROL METHOD	9/1/2017	15/694,578
Dell Products L.P.	SERVER INFORMATION HANDLING SYSTEM NFC MANAGEMENT SIDEBAND FEEDBACK	9/5/2017	15/695,399
Dell Products L.P.	SYSTEM AND METHOD FOR TUNNELING OF MANAGEMENT TRAFFIC	9/7/2017	15/698,125
Dell Products L.P.	INTEGRATED AIR-SPRING FOR HYDRAULIC FORCE DAMPING OF A RIGID LIQUID HANDLING SYSTEM	9/8/2017	15/698,642
Dell Products L.P.	BLOCK CHASSIS SLED HAVING ONE-THIRD WIDTH COMPUTING AND STORAGE NODES FOR INCREASED PROCESSING AND STORAGE CONFIGURATION FLEXIBILITY WITHIN A MODULAR, SCALABLE AND/OR EXPANDABLE RACK-BASED INFORMATION HANDLING SYSTEM	9/8/2017	15/698,645
Dell Products L.P.	METHOD TO IMPROVE KEYBOARD BACKLIGHT PERFORMANCE	9/11/2017	15/701,169
Dell Products L.P.	ADAPTERS, SYSTEMS AND METHODS FOR ADAPTING PCIE EXPANSION CARDS TO PCIE COMPONENT BAYS	9/12/2017	15/702,299
Dell Products L.P.	VIRTUAL FDISC FOR REMOTE LOGIN	9/12/2017	15/702,618
Dell Products L.P.	INFORMATION HANDLING SYSTEM DISPLAY INTELLIGENT CONTROL RESPONSE TIME	9/13/2017	15/703,214
Dell Products L.P.	POWER STORAGE ADAPTER FOR WIRELESS POWER TRANSMISSION	9/14/2017	15/704,808
Dell Products L.P.	METHOD FOR MINIMIZING MOVEMENT OF PCB LAMINATE DURING REFLOW AND WAVE SOLDER VIA MECHANICAL RETENTION	9/15/2017	15/706,354
Dell Products L.P.	CONFIGURING HOT-INSERTED PCIE DEVICES VIA ACPI	9/15/2017	15/706,382
Dell Products L.P.	SYSTEM AND METHOD FOR NATURAL LANGUAGE INTERFACE TO NETWORK DEVICES	9/15/2017	15/706,548



Owner	Title	Date	Application No.
Dell Products L.P.	SYSTEM AND METHOD OF UTILIZING MULTIPLE WIRELESS PROTOCOLS	9/18/2017	15/707,264
Dell Products L.P.	MULTILAYER THERMAL LAMINATE WITH AEROGEL FOR BATTERY CELL ENCLOSURES	9/18/2017	15/707,365
Dell Products L.P.	SYSTEMS AND METHODS OF ADAPTIVE THERMAL CONTROL FOR INFORMATION HANDLING SYSTEMS	9/18/2017	15/707,649
Dell Products L.P.	POWER STORAGE ADAPTER WITH POWER CABLE VALIDATION	9/18/2017	15/707,670
Dell Products L.P.	DSAMM - DYNAMIC SLED AIRFLOW MANAGEMENT MECHANISM	9/19/2017	15/709,060
Dell Products L.P.	METHOD TO PROPAGATE FAULTS ON STACK LINKS TO CONNECTED DEVICES	9/20/2017	15/710,624
Dell Products L.P.	INFORMATION HANDLING SYSTEM MULTI-TORQUE DUAL AXIS HINGE	9/21/2017	15/711,023
Dell Products L.P.	MACHINE LEARNING INDOOR NAVIGATION	9/21/2017	15/711,771
Dell Products L.P.	POE PD COPPER TO FIBER OPTIC CONVERTER AND APPLIANCE	9/21/2017	15/711,829
Dell Products L.P.	SYSTEMS AND METHODS FOR DYNAMICALLY MODIFYING MEMORY NAMESPACE ALLOCATION BASED ON MEMORY ATTRIBUTES AND APPLICATION REQUIREMENTS	9/22/2017	15/712,409
Dell Products L.P.	DYNAMIC ANTENNA CONFIGURATION ON SYSTEMS WITH SPARE ANTENNAS	9/22/2017	15/712,461
Dell Products L.P.	INFORMATION HANDLING SYSTEM HAVING AN ERGONOMIC PLUNGER FOR A SERVER PLANAR BOARD	9/25/2017	15/714,655
Dell Products L.P.	INFORMATION HANDLING SYSTEM WITH AN ADJUSTABLE GUIDE FOR PERIPHERAL CARDS	9/25/2017	15/714,709
Dell Products L.P.	METHOD OF DETERMINING THE LINE STATUS AND POWER CAPABILITY OF A POWER SUPPLY	9/26/2017	15/715,788
Dell Products L.P.	BOOT DISK DETECTION AND MANAGEMENT IN AN INFORMATION HANDLING SYSTEM MANUFACTURING ENVIRONMENT	9/26/2017	15/715,891
Dell Products L.P.	POWER DELIVERY BASED ON TEMPERATURE AND OTHER FACTORS IN A POWER STORAGE ADAPTER	9/26/2017	15/716,024
Dell Products L.P.	APPLICATION PROFILING VIA LOOPBACK METHOD	9/29/2017	15/719,789
Dell Products L.P.	14G PORTFOLIO BEZEL LOCK, AND LATCHING MECHANISM	9/29/2017	15/719,879
Dell Products L.P.	ACCELERATING MACHINE LEARNING AND PROFILING OVER A NETWORK	10/3/2017	15/723,572
Dell Products L.P.	METHOD OF SMART LED CONTROL FOR USB-C AC ADAPTER	10/3/2017	15/723,987

Owner	Title	Date	Application No.
Dell Products L.P.	STORING AND PROCESSING JSON DOCUMENTS IN A SQL DATABASE TABLE	10/4/2017	15/724,457
Dell Products L.P.	HARD DRIVE CARRIER FOR AN INFORMATION HANDLING SYSTEM	10/5/2017	15/725,690
Dell Products L.P.	SYSTEMS AND METHODS FOR PROVIDING POST-PACKAGE REPAIR VISIBILITY TO A HOST FOR MEMORY RELIABILITY, AVAILABILITY, AND SERVICEABILITY	10/5/2017	15/726,065
Dell Products L.P.	METHOD TO RECOVER ESPI EC FROM A WATCHDOG HARDWARE RESET.	10/5/2017	15/726,119
Dell Products L.P.	SYSTEM AND METHOD FOR POST-PACKAGE REPAIR ACROSS DRAM BANKS AND BANK GROUPS	10/5/2017	15/726,179
Dell Products L.P.	SYSTEMS AND METHODS FOR SELECTIVE SAVE OPERATIONS IN A PERSISTENT MEMORY	10/6/2017	15/727,173
Dell Products L.P.	SYSTEMS AND METHODS FOR GRANULAR NON-VOLATILE MEMORY HEALTH VISIBILITY TO A HOST	10/6/2017	15/727,207
Dell Products L.P.	SYSTEM AND METHOD OF MANAGING PROCESSOR INSTRUCTIONS ASSOCIATED WITH A DEVICE	10/6/2017	15/727,364
Dell Products L.P.	INFORMATION HANDLING SYSTEM OPTICAL NARROW BEZEL	10/10/2017	15/728,804
Dell Products L.P.	MAGNETIC LATCH WITH POLARITY ASSISTED OPENING	10/11/2017	15/730,166
Dell Products L.P.	CONTEXT AND DEVICE STATE DRIVEN MULTILEVEL AUTHORIZATION FOR IOT DEVICES	10/12/2017	15/782,190
Dell Products L.P.	INFORMATION HANDLING SYSTEM WITH INCREASED AIR VELOCITY TO COOL INTERNAL COMPONENTS	10/12/2017	15/782,357
Dell Products L.P.	SYSTEMS AND METHODS FOR SECURE RUNTIME DYNAMIC RESIZING OF MEMORY NAMESPACES	10/13/2017	15/783,011
Dell Products L.P.	ACTIVE PEN SYSTEM	10/13/2017	15/783,410
Dell Products L.P.	SYSTEM AND METHOD OF OPERATING AN INFORMATION HANDLING SYSTEM	10/13/2017	15/783,848
Dell Products L.P.	SYSTEMS AND METHODS FOR CONCEALED OBJECT STORE IN A VIRTUALIZED INFORMATION HANDLING SYSTEM	10/16/2017	15/784,409
Dell Products L.P.	SPANNED RAID WITH NESTED PARITY	10/16/2017	15/784,786
Dell Products L.P.	OVER CURRENT PROTECTION IN A VARIABLE OUTPUT POWER SUPPLY	10/16/2017	15/785,154
Dell Products L.P.	STORAGE CLASS MEMORY (SCM) MEMORY MODE CACHE SYSTEM	10/17/2017	15/786,356
Dell Products L.P.	SYSTEM AND METHOD FOR HORIZONTAL LEVELING OF SERVER	10/18/2017	15/787,248

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	RACKS		
Dell Products L.P.	INTELLIGENT WIRELESS CHARGING SYSTEM	10/23/2017	15/790,213
Dell Products L.P.	POWER MANAGEMENT COMPENSATION FOR SYSTEM WITH OLED DISPLAY (RESUBMIT 103872)	10/23/2017	15/790,766
Dell Products L.P.	SYSTEM AND METHOD OF UTILIZING MULTIPLE NETWORKS	10/27/2017	15/795,790
Dell Products L.P.	METHOD TO ENABLE MULTIPLE LAYERS OF TOUCH ON DELL CANVAS BASED ON ACCESSORY USAGE	10/27/2017	15/796,140
Dell Products L.P.	CACHE SHARING IN VIRTUAL CLUSTERS	10/27/2017	15/796,736
Dell Products L.P.	MULTIPLE VXLAN TUNNEL REACHABILITY	10/30/2017	15/797,312
Dell Products L.P.	TRANSFORMER THERMAL RADIATOR FOR POWER FIELD EFFECT TRANSISTORS	10/30/2017	15/797,434
Dell Products L.P.	OPTIMIZING TRAFFIC PATHS TO ORPHANED HOSTS IN VXLAN NETWORKS USING VIRTUAL LINK TRUNKING-BASED MULTI-HOMING	10/30/2017	15/798,255
Dell Products L.P.	APPLYING MACHINE LEARNING TO DYNAMICALLY SCALE COMPUTING RESOURCES TO SATISFY A SERVICE LEVEL AGREEMENT (SLA)	10/31/2017	15/798,645
Dell Products L.P.	INFORMATION HANDLING SYSTEM RAIL CLIP AUTOMATIC CLAMPING	11/1/2017	15/800,258
Dell Products L.P.	AUDITING DATABASES FOR SECURITY VULNERABILITIES	11/1/2017	15/800,378
Dell Products L.P.	FLEX CABLE RETENTION	11/1/2017	15/800,638
Dell Products L.P.	INFORMATION HANDLING SYSTEM INTEGRATED DEVICE KEY ACTUATOR	11/1/2017	15/800,810
Dell Products L.P.	INFORMATION HANDLING SYSTEM PREDICTIVE KEY RETRACTION AND EXTENSION ACTUATION	11/1/2017	15/800,821
Dell Products L.P.	INFORMATION HANDLING SYSTEM INTEGRATED DEVICE ACTUATOR MONITORING	11/1/2017	15/800,829
Dell Products L.P.	METHOD TO SUPPORT DUAL PLANAR ATTACHMENT WITHIN A CHASSIS	11/1/2017	15/800,881
Dell Products L.P.	SYSTEM AND METHOD FOR OPERATING A LIVING ANTENNA APERTURE MECHANISM	11/2/2017	15/801,617
Dell Products L.P.	SYSTEMS AND METHODS FOR ENHANCED ROM ACCESS RESILIENCY	11/2/2017	15/801,879
Dell Products L.P.	DEFINING A ZONE TO PERFORM AN ACTION IN A DUAL-SCREEN TABLET	11/2/2017	15/801,948
Dell Products L.P.	AUTOMATICALLY SELECTING A SET OF PARAMETER VALUES THAT PROVIDE A HIGHER LINK SCORE	11/2/2017	15/801,981

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Dell Products L.P.	A NEW DESIGNED ARCHITECTURE TO ACHIEVE SLI WITH DUAL GRAPHIC CARDS IN 15" NOTEBOOK PC SYSTEM	11/2/2017	15/802,054
Dell Products L.P.	UNDERSTANDING USER PRODUCT QUERIES IN REAL TIME WITHOUT USING ANY RULES	11/3/2017	15/802,666
Dell Products L.P.	SYSTEM AND METHOD FOR ENABLING HYBRID INTEGRATION PLATFORM THROUGH RUNTIME AUTO-SCALABLE DEPLOYMENT MODEL FOR VARYING INTEGRATION	11/3/2017	15/802,919
Dell Products L.P.	SYSTEM AND METHOD TO SUPPORT BOOT GUARD FOR ORIGINAL DEVELOPMENT MANUFACTURER BIOS DEVELOPMENT	11/3/2017	15/803,128
Dell Products L.P.	METHOD AND APPARATUS FOR OPTIMIZING CONFIGURATIONS FOR TRANSCIEIVING UP TO TEN DATA STREAMS VIA FOUR ANTENNAS	11/3/2017	15/803,413
Dell Products L.P.	METHOD AND APPARATUS FOR OPERATING AN ANTENNA CO-EXISTENCE CONTROLLER	11/3/2017	15/803,497
Dell Products L.P.	SYSTEM AND METHOD FOR OPERATING AN ANTENNA ADAPTATION CONTROLLER MODULE	11/3/2017	15/803,571
Dell Products L.P.	BEZEL FOR INFORMATION HANDLING SYSTEM	9/5/2017	29/616,264
Dell Products L.P.	INFORMATION HANDLING SYSTEM HOUSING	9/11/2017	29/616,976
Dell Products L.P.	PEN	9/25/2017	29/618,815
Dell Products L.P.	HEAD MOUNTED DISPLAY	10/6/2017	29/621,365
Dell Products L.P.	INFORMATION HANDLING SYSTEM STAND	10/17/2017	29/622,433
Dell Products L.P.	DISPLAY STAND	10/19/2017	29/622,729
EMC Corporation	METHOD TO REDUCE INDEX WRITE-AMPLIFICATION	10/12/2017	62/571,584
EMC IP Holding Company LLC	APPLICATION LEVEL SUPPORT FOR SELECTIVELY ACCESSING FILES IN CLOUD-BASED STORAGE	8/7/2017	15/670,444
EMC IP Holding Company LLC	MULTIPROCESSOR MESSAGING SYSTEM	8/15/2017	15/677,698
EMC IP Holding Company LLC	SCALABLE DISTRIBUTED DATA STREAMING COMPUTATIONS ACROSS MULTIPLE DATA PROCESSING CLUSTERS	8/22/2017	15/683,169
EMC IP Holding Company LLC	SCALABLE DISTRIBUTED COMPUTATIONS UTILIZING MULTIPLE DISTINCT COMPUTATIONAL FRAMEWORKS	8/22/2017	15/683,243
EMC IP Holding Company LLC	SCALABLE DISTRIBUTED COMPUTATIONS UTILIZING MULTIPLE	8/22/2017	15/683,269

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	DISTINCT CLOUDS		
EMC IP Holding Company LLC	MANAGING USE OF SECURITY KEYS	8/23/2017	15/684,087
EMC IP Holding Company LLC	TECHNIQUE FOR FAST AND EFFICIENT CATEGORIZATION OF LOG MESSAGES	8/23/2017	15/684,235
EMC IP Holding Company LLC	HTTPS ENABLED CLIENT TOOL	8/23/2017	15/684,529
EMC IP Holding Company LLC	DISCOVERING NEW BACKUP CLIENTS	8/23/2017	15/684,825
EMC IP Holding Company LLC	CALCULATION OF SYSTEM UTILIZATION	8/24/2017	15/685,113
EMC IP Holding Company LLC	PARALLEL NODE BACKUP FOR CSV	8/25/2017	15/686,409
EMC IP Holding Company LLC	CONFIGURABLE BEZEL FOR ATTACHMENT TO ELECTRONIC EQUIPMENT CHASSIS	8/25/2017	15/686,639
EMC IP Holding Company LLC	SELF-DESCRIBED QUERY EXECUTION IN A MASSIVELY PARALLEL SQL EXECUTION ENGINE	8/29/2017	15/689,867
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR PROCESSING DATA	8/30/2017	15/691,552
EMC IP Holding Company LLC	SYSTEMS AND METHODS TO CREATE MISSION CRITICAL RESOURCE DATA AVAILABLE FOR DR SCENARIOS IN THE CLOUD USING EMC CLOUDBOOST FILE SERVICES (GEONAS)	8/31/2017	15/692,800
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR ASYNCHRONOUS CLEANING OF DATA OBJECTS ON CLOUD PARTITION IN A FILE SYSTEM WITH DEDUPLICATION	8/31/2017	15/692,886
EMC IP Holding Company LLC	HIGH AVAILABILITY TRANSACTIONAL REPLICATION	9/8/2017	15/699,036
EMC IP Holding Company LLC	LATCHING ASSEMBLY	9/13/2017	15/703,265
EMC IP Holding Company LLC	METHOD OF TRACKING AND ANALYZING DATA INTEGRITY ISSUES BY LEVERAGING CLOUD SERVICES	9/14/2017	15/705,010
EMC IP Holding Company LLC	INTERACTIVE TIERING PREFERENCES MAP	9/18/2017	15/707,091
EMC IP Holding Company LLC	HEALTHBOOK	9/19/2017	15/708,679
EMC IP Holding Company LLC	METHOD AND APPARATUS FOR FAILOVER IN A VIDEO SURVEILLANCE SYSTEM	9/20/2017	15/709,591
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR MANAGING STORAGE SYSTEM	9/20/2017	15/709,667
EMC IP Holding Company LLC	METHOD AND DEVICE FOR MIGRATING DATA	9/20/2017	15/709,770
EMC IP Holding Company LLC	PERTURBATION MONKEY ADAPTIVE SCHEDULE PLANNER	9/20/2017	15/709,869

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EMC IP Holding Company LLC	METHOD OF CATEGORIZING DATA AND ITS BACKUP DESTINATION	9/20/2017	15/709,938
EMC IP Holding Company LLC	METHOD AND DEVICE FOR MANAGING CACHES	9/20/2017	15/709,951
EMC IP Holding Company LLC	METHODS AND DEVICES OF BATCH PROCESS OF CONTENT MANAGEMENT	9/20/2017	15/710,111
EMC IP Holding Company LLC	MULTIPATH STORAGE DEVICE BASED ON MULTI-DIMENSIONAL HEALTH DIAGNOSIS	9/20/2017	15/710,796
EMC IP Holding Company LLC	METHOD OF MANAGING REDUNDANT ARRAY OF INDEPENDENT DISKS AND ELECTRONIC DEVICE	9/20/2017	15/710,809
EMC IP Holding Company LLC	METHOD AND DEVICE FOR STORING DATA	9/21/2017	15/710,956
EMC IP Holding Company LLC	INDICATION OF SEARCH RESULT	9/21/2017	15/710,975
EMC IP Holding Company LLC	STORAGE DEVICE AND METHOD FOR MANAGING STORAGE DEVICE	9/21/2017	15/711,020
EMC IP Holding Company LLC	METHOD AND DEVICE FOR STORAGE MANAGEMENT	9/21/2017	15/711,107
EMC IP Holding Company LLC	METHOD AND DEVICE FOR MANAGING INDEX	9/21/2017	15/711,172
EMC IP Holding Company LLC	METHOD, DEVICE, AND SYSTEM FOR FAULT UNIT INDICATION	9/22/2017	15/712,262
EMC IP Holding Company LLC	METHOD, APPARATUS, AND SYSTEM FOR DATA DEDUPLICATION	9/22/2017	15/712,280
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR MANAGING DATA ACCESS IN STORAGE SYSTEM	9/22/2017	15/712,324
EMC IP Holding Company LLC	HYBRID COPYING GARBAGE COLLECTOR	9/22/2017	15/712,340
EMC IP Holding Company LLC	ADAPTOR FOR USE IN STORAGE DEVICE	9/22/2017	15/712,354
EMC IP Holding Company LLC	METHOD, APPARATUS, AND SYSTEM FOR CACHING DATA	9/22/2017	15/712,418
EMC IP Holding Company LLC	FLUSHING PAGES FROM SOLID-STATE STORAGE DEVICE	9/22/2017	15/712,483
EMC IP Holding Company LLC	DISTRIBUTED MANAGEMENT OPTIMIZATION FOR IOT DEPLOYMENTS	9/22/2017	15/712,834
EMC IP Holding Company LLC	AGENTLESS VIRTUAL DISK METADATA INDEXING	9/22/2017	15/713,040
EMC IP Holding Company LLC	PARALLEL PROCESSING DATABASE SYSTEM	9/25/2017	15/714,637
EMC IP Holding Company LLC	PLUGGABLE STORAGE SYSTEM FOR PARALLEL QUERY ENGINES	9/25/2017	15/714,651
EMC IP Holding Company LLC	SMART LOG PARSER FOR BACKUP SOFTWARE TO EASE TROUBLESHOOTING	9/25/2017	15/714,903
EMC IP Holding Company LLC	HANDLING A VIRTUAL DATA MOVER (VDM) FAILOVER SITUATION BY PERFORMING A NETWORK INTERFACE CONTROL OPERATION THAT CONTROLS AVAILABILITY OF NETWORK	9/26/2017	15/715,787

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	INTERFACES PROVIDED BY A VDM		
EMC IP Holding Company LLC	METHOD AND APPARATUS FOR DEVELOPER CODE RISK ASSESSMENT	9/26/2017	15/716,223
EMC IP Holding Company LLC	DYNAMIC HONEYPOTS FOR COMPUTER PROGRAM EXECUTION ENVIRONMENTS	9/27/2017	15/716,836
EMC IP Holding Company LLC	VIRTUAL MACHINE IMAGE BACKUP TO EXCLUDE SYSTEM PAGE FILE	9/27/2017	15/717,184
EMC IP Holding Company LLC	USING PERSISTENT MEMORY TECHNOLOGY AS A HOST-SIDE STORAGE TIER FOR CLUSTERED/DISTRIBUTED FILE SYSTEMS, MANAGED BY HOST-SIDE TIER	9/27/2017	15/717,771
EMC IP Holding Company LLC	USING PERSISTENT MEMORY TECHNOLOGY AS A HOST-SIDE STORAGE TIER FOR CLUSTERED/DISTRIBUTED FILE SYSTEMS, MANAGED BY CLUSTER FILE SYSTEM	9/27/2017	15/717,776
EMC IP Holding Company LLC	USING PERSISTENT MEMORY TECHNOLOGY AS A HOST-SIDE STORAGE TIER FOR CLUSTERED/DISTRIBUTED FILE SYSTEMS, MANAGED BY STORAGE APPLIANCE	9/27/2017	15/717,779
EMC IP Holding Company LLC	RULE BASED DATA TRANSFER MODEL TO CLOUD	9/28/2017	15/718,373
EMC IP Holding Company LLC	SCALABLE PREDICTIVE EARLY WARNING SYSTEM FOR DATA BACKUP EVENT LOG	9/28/2017	15/718,465
EMC IP Holding Company LLC	DISTRIBUTED DATA ANALYTICS	9/28/2017	15/719,231
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR ANALYZING APPLICATION MAXIMUM PARALLEL CLONE SESSIONS FOR STORAGE DEVICES	9/28/2017	15/719,269
EMC IP Holding Company LLC	TRANSIENT SHARING OF AVAILABLE SAN COMPUTE CAPABILITY	9/28/2017	15/719,324
EMC IP Holding Company LLC	FAST BACKUP SOLUTION FOR CLUSTER SHARED VOLUMES USING PARALLEL SAVE STREAMS	9/29/2017	15/721,440
EMC IP Holding Company LLC	FAST HYPER-V PROTECTION USING PARALLEL SAVE STREAMS	9/29/2017	15/721,447
EMC IP Holding Company LLC	EFFICIENT DEDUPLICATION OF COMPRESSED FILES	9/29/2017	15/721,562
EMC IP Holding Company LLC	METHOD AND APPARATUS TO HAVE SNAPSHOTS FOR THE FILES IN A TIER IN A DE-DUPLICATION FILE SYSTEM	9/30/2017	15/721,859
EMC IP Holding Company LLC	DATA COMPRESSION BY HAMMING DISTANCE CATEGORIZATION	10/2/2017	15/722,073
EMC IP Holding	SYSTEMS AND METHODS FOR	10/2/2017	15/722,748

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Company LLC	PERFORMING DATA PROTECTION OPERATIONS WITH A PROXY REGISTER		
EMC IP Holding Company LLC	ENVIRONMENT INDEPENDENT DATA PROTECTION IN A HIGHLY AVAILABLE DATA SYSTEM	10/2/2017	15/722,778
EMC IP Holding Company LLC	ENHANCED AUTHENTICATION METHOD FOR HADOOP JOB CONTAINERS	10/3/2017	15/723,418
EMC IP Holding Company LLC	METHODS AND SYSTEMS FOR SOFTWARE PROTECTION WITHIN AN ISOLATED ENVIRONMENT	10/3/2017	15/724,010
EMC IP Holding Company LLC	FAST NATIVE FILE SYSTEM CREATION FOR BACKUP FILES ON DEDUPLICATION SYSTEMS	10/3/2017	15/724,201
EMC IP Holding Company LLC	INPUT/OUTPUT (I/O) INSPECTION METHODS AND SYSTEMS TO DETECT AND DEFEND AGAINST CYBERSECURITY THREATS	10/4/2017	15/724,814
EMC IP Holding Company LLC	INTEGRATED QOS WITHIN DATA-PROTECTION APPLICATION	10/5/2017	15/725,379
EMC IP Holding Company LLC	DATA ISOLATION SYSTEM WITH SECURITY DEVICES	10/6/2017	15/726,967
EMC IP Holding Company LLC	METHODS AND SYSTEMS FOR EXECUTING A SOFTWARE APPLICATION USING A CONTAINER	10/6/2017	15/726,977
EMC IP Holding Company LLC	FOCUSED SANITIZATION PROCESS FOR DEDUPLICATED STORAGE SYSTEMS	10/6/2017	15/727,010
EMC IP Holding Company LLC	SECURITY PROTECTION FOR VIRTUAL MACHINE BACKUPS	10/6/2017	15/727,260
EMC IP Holding Company LLC	METHOD FOR AUTOMATIC INSTANT ACCESS MOUNT POINT CLEANUP	10/6/2017	15/727,268
EMC IP Holding Company LLC	DATA ROUTING IN INFORMATION PROCESSING SYSTEM UTILIZING PERSISTENT MEMORY	10/6/2017	15/727,280
EMC IP Holding Company LLC	EFFECTIVE METHOD TO BACK UP VMS IN LARGER VM INFRASTRUCTURE	10/6/2017	15/727,308
EMC IP Holding Company LLC	INTELLIGENT SELECTION OF BACKUP LEVELS	10/6/2017	15/727,346
EMC IP Holding Company LLC	DYNAMIC DE-DUPLICATION METHODOLOGIES FOR EFFICIENT RESOURCE UTILIZATION ON DE-DUPLICATION SYSTEM	10/6/2017	15/727,363
EMC IP Holding Company LLC	FOREVER INCREMENTAL CONTENT INDEXING OF FOREVER INCREMENTAL BLOCK-BASED BACKUPS	10/6/2017	15/727,385
EMC IP Holding Company LLC	OVERLAY SNAPS	10/6/2017	15/727,424
EMC IP Holding Company LLC	DYNAMIC MEMORY BUFFERING USING CONTAINERS	10/6/2017	15/727,427
EMC IP Holding Company LLC	EFFICIENT FILE SYSTEM PARSING USING SNAP BASED REPLICATION	10/6/2017	15/727,867
EMC IP Holding Company LLC	HOST DATA REPLICATION USING DEDUPLICATION AND BINARY SEARCH	10/10/2017	15/728,758



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	TREES		
EMC IP Holding Company LLC	OPTIMIZATION TO PERMIT BLOCK BASED INCREMENTAL BACKUP ACROSS SYSTEM REBOOT OR CRASH	10/11/2017	15/730,089
EMC IP Holding Company LLC	CLOSED-LOOP IT ISSUE REMEDIATION WITH OPTIONAL CUSTOMER APPROVAL	10/11/2017	15/730,108
EMC IP Holding Company LLC	MIGRATION OF VERSIONED DATA BETWEEN STORAGE DEVICES	10/11/2017	15/730,143
EMC IP Holding Company LLC	DATA MANAGEMENT FOR EXTENDED MULTI-CLOUD ENVIRONMENT	10/12/2017	15/730,990
EMC IP Holding Company LLC	DICTIONARY SYNCHRONIZATION OVER A TRANSPORT WITH GUARANTEED ORDERING	10/12/2017	15/782,055
EMC IP Holding Company LLC	MEMORY FABRIC WITH RELIABILITY ZONE COMPRISING TWO OR MORE FABRIC ATTACHED MEMORY ENDPOINTS	10/12/2017	15/782,384
EMC IP Holding Company LLC	CONTENT INDEXED INTEGRATED COPY DATA BY INTEGRATING ELASTIC SEARCH AND STORAGE SYSTEM SNAPSHOT DIFFERENTIAL DATA	10/13/2017	15/783,235
EMC IP Holding Company LLC	REFERENCE TRACKING GARBAGE COLLECTION FOR GEOGRAPHICALLY DISTRIBUTED STORAGE SYSTEM	10/16/2017	15/784,317
EMC IP Holding Company LLC	METHODS AND APPARATUS FOR GENERATING CASUALITY MATRIX AND IMPACTS USING GRAPH PROCESSING	10/16/2017	15/784,334
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR IMPROVED PERFORMANCE QOS WITH SERVICE LEVELS AND STORAGE GROUPS	10/16/2017	15/784,598
EMC IP Holding Company LLC	BALANCE RAID BACKGROUND I/O WITH USER I/O BASED ON DYNAMIC CREDITS	10/16/2017	15/784,657
EMC IP Holding Company LLC	MANAGEMENT OF STATE INFORMATION BACKUP FOR AN AUXILIARY STORAGE SERVICE IN A MICROSERVICE ARCHITECTURE	10/17/2017	15/785,519
EMC IP Holding Company LLC	SINGLE STEP MERGING OF A VIRTUAL HARD DISK CHAIN	10/18/2017	15/786,881
EMC IP Holding Company LLC	USER I/O THROTTLING BASED ON MULTI-LEVEL CREDITS	10/18/2017	15/787,095
EMC IP Holding Company LLC	FAST BIND RAID GROUP DURING EXTENT POOL EXPANDING	10/18/2017	15/787,154
EMC IP Holding Company LLC	EXTENT POOL MANAGES DISK LEVEL CREDITS	10/18/2017	15/787,187
EMC IP Holding Company LLC	A METHOD TO INTEGRATE NVME DEVICE WITH DRAM CACHE FOR WRITE IO ACCELERATE IN MIDRANGE DISK ARRAY	10/19/2017	15/787,847
EMC IP Holding Company LLC	DATA DEDUPLICATION ACCELERATION	10/19/2017	15/787,930
EMC IP Holding	TELEMETRY SERVICE	10/19/2017	15/788,383

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Company LLC			
EMC IP Holding Company LLC	REPLICATION BASED SECURITY	10/19/2017	15/788,686
EMC IP Holding Company LLC	EXCLUDING FILES IN A BLOCK BASED BACKUP	10/20/2017	15/788,877
EMC IP Holding Company LLC	ACCELERATED PERFORMANCE USING ENHANCED PREDICTIVE MODELLING	10/20/2017	15/789,017
EMC IP Holding Company LLC	OPTIMIZATIONS TO AVOID INTERSOCKET LINKS	10/20/2017	15/789,127
EMC IP Holding Company LLC	DISTRIBUTED DATA PROTECTION MANAGEMENT IN MULTI-CLOUD COMPUTING ENVIRONMENT	10/20/2017	15/789,263
EMC IP Holding Company LLC	VIRUS SCANNING ON STORAGE SYSTEMS COMPRISING MULTIPLE STORAGE SERVERS WITH A PLURALITY OF FILE SYSTEMS	10/20/2017	15/789,443
EMC IP Holding Company LLC	ENHANCED SERVICING FOR MULTI-DRIVE SLEDS	10/23/2017	15/790,365
EMC IP Holding Company LLC	HYBRID DATA DEDUPLICATION FOR ELASTIC CLOUD STORAGE DEVICES	10/23/2017	15/790,377
EMC IP Holding Company LLC	SCALE-OUT ERASURE CODING	10/23/2017	15/791,388
EMC IP Holding Company LLC	SCALE-OUT DISTRIBUTED ERASURE CODING	10/23/2017	15/791,390
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR REVERSE REPLICATION	10/23/2017	15/791,396
EMC IP Holding Company LLC	PREDICTING PHYSICAL STORAGE UNIT HEALTH	10/24/2017	15/791,485
EMC IP Holding Company LLC	AUTOMATED CAPTURE AND RECOVERY OF APPLICATIONS IN A FUNCTION-AS-A-SERVICE ENVIRONMENT	10/24/2017	15/791,763
EMC IP Holding Company LLC	HYBRID RELIABILITY AND COST BASED METHOD FOR RESOURCE ALLOCATIONS IN SOFTWARE DEFINED INFRASTRUCTURES	10/24/2017	15/791,775
EMC IP Holding Company LLC	DIRECTIONAL CONSISTENCY IN CAPTURE AND RECOVERY OF CLOUD-NATIVE APPLICATIONS	10/24/2017	15/791,799
EMC IP Holding Company LLC	DISASTER RECOVERY WITH DISTRIBUTED ERASURE CODING	10/24/2017	15/792,714
EMC IP Holding Company LLC	BATCH MODE OBJECT CREATION IN AN ELASTIC CLOUD DATA STORAGE ENVIRONMENT	10/24/2017	15/792,745
EMC IP Holding Company LLC	OPPORTUNISTIC COMPRESSION OF REPLICATED DATA IN A CONTENT ADDRESSABLE STORAGE SYSTEM	10/25/2017	15/793,121
EMC IP Holding Company LLC	COMPRESSION SIGNALING FOR REPLICATION PROCESS IN A CONTENT ADDRESSABLE STORAGE SYSTEM	10/25/2017	15/793,147
EMC IP Holding	BUSINESS DATA LAKE SEARCH ENGINE	10/26/2017	15/794,387

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Company LLC			
EMC IP Holding Company LLC	COMPRESSING DATA TO BE REPLICATED UTILIZING A COMPRESSION METHOD SELECTED BASED ON NETWORK BEHAVIOR	10/26/2017	15/794,613
EMC IP Holding Company LLC	OPPORTUNISTIC 'XOR' OF DATA FOR GEOGRAPHICALLY DIVERSE STORAGE	10/26/2017	15/794,950
EMC IP Holding Company LLC	NON-DISRUPTIVE INSERTION OF VIRTUALIZED STORAGE APPLIANCE	10/27/2017	15/795,424
EMC IP Holding Company LLC	DATA ENCRYPTING SYSTEM WITH ENCRYPTION SERVICE MODULE AND SUPPORTING INFRASTRUCTURE FOR TRANSPARENTLY PROVIDING ENCRYPTION SERVICES TO ENCRYPTION SERVICE CONSUMER PROCESSES ACROSS ENCRYPTION SERVICE STATE CHANGES	10/27/2017	15/795,482
EMC IP Holding Company LLC	STORAGE SYSTEM WITH NETWORK-WIDE CONFIGURABLE DEVICE NAMES	10/27/2017	15/795,653
EMC IP Holding Company LLC	LOAD BALANCING OF I/O BY MOVING LOGICAL UNIT (LUN) SLICES BETWEEN NON-VOLATILE STORAGE REPRESENTED BY DIFFERENT ROTATION GROUPS OF RAID (REDUNDANT ARRAY OF INDEPENDENT DISKS) EXTENT ENTRIES IN A RAID EXTENT TABLE OF A MAPPED RAID DATA STORAGE SYSTEM	10/27/2017	15/795,655
EMC IP Holding Company LLC	CLOUD-BASED SNAPSHOTS WITH COARSE AND FINE GRANULARITY MAPS FOR CHANGED DATA	10/27/2017	15/795,713
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR IMPLEMENTING A CLOUD NATIVE CROWDSOURCED CYBER SECURITY SERVICE	10/27/2017	15/795,744
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR IMPLEMENTING CLOUD NATIVE APPLICATION THREAT DETECTION	10/27/2017	15/795,852
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR LOAD BALANCING BACKUP RESOURCES	10/27/2017	15/795,914
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR IMPLEMENTING RISK BASED CYBER SECURITY	10/27/2017	15/795,967
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR ASSIGNING CLIENTS TO BACKUP RESOURCES	10/27/2017	15/795,978
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR IMPLEMENTING DATA LOSSLESS SYNTHETIC FULL BACKUPS	10/27/2017	15/795,980
EMC IP Holding Company LLC	AUTOMATED AGENT FOR THE CAUSAL MAPPING OF COMPLEX ENVIRONMENTS	10/27/2017	15/796,010
EMC IP Holding	METHOD AND SYSTEM FOR	10/27/2017	15/796,013

Owner	Title	Date	Application No.
Company LLC	COMPLIANCE MAP ENGINE		
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR BINDING CHASSIS AND COMPONENTS	10/27/2017	15/796,061
EMC IP Holding Company LLC	HYPER-V INTELLIGENT SCALE-OUT FEDERATED RESTORE	10/27/2017	15/796,455
EMC IP Holding Company LLC	MANAGING DATA STORAGE ARRAYS ON BEHALF OF HOST COMPUTERS VIA SPECIALIZED LUN-RELATED QUERIES	10/30/2017	15/796,976
EMC IP Holding Company LLC	EVALUATION OF ANOMALY DETECTION ALGORITHMS USING IMPERSONATION DATA DERIVED FROM USER DATA	10/30/2017	15/797,065
EMC IP Holding Company LLC	ELASTIC SCALING JOB THREAD POOL IN A CLOUD EVENT PROCESS INFRASTRUCTURE	10/30/2017	15/797,123
EMC IP Holding Company LLC	STORAGE DRIVERS FOR REMOTE REPLICATION MANAGEMENT	10/30/2017	15/797,210
EMC IP Holding Company LLC	TECHNIQUES FOR PERSISTING AND MODIFYING CONFIGURATION REQUIREMENT STATE INFORMATION IN A MULTIPLE NODE SYSTEM	10/30/2017	15/797,220
EMC IP Holding Company LLC	DATA STORAGE SYSTEM DYNAMICALLY RE-MARKING SLICES FOR RECLAMATION FROM INTERNAL FILE SYSTEM TO POOL STORAGE	10/30/2017	15/797,284
EMC IP Holding Company LLC	DATA STORAGE SYTEM USING IN-MEMORY STRUCTURE ROR RECLAMING SPACE FROM INTERNAL FILE SYSTEM TO POOL STORAGE	10/30/2017	15/797,323
EMC IP Holding Company LLC	VIRTUAL STORAGE DOMAIN FOR A CONTENT ADDRESSABLE SYSTEM	10/30/2017	15/797,324
EMC IP Holding Company LLC	BOOKMARKED POINTS-IN-TIME (PIT) FOR ASYNCHRONOUS REPLICATION	10/30/2017	15/797,329
EMC IP Holding Company LLC	DATA STORAGE SYSTEM EMPLOYING SERVICE INFRASTRUCTURE FOR FUNCTIONAL MODULES	10/30/2017	15/797,344
EMC IP Holding Company LLC	AUTOMATED SECURITY INCIDENT REMEDIATION RECOMMENDER	10/30/2017	15/797,496
EMC IP Holding Company LLC	GRAPHICAL REPRESENTATION OF APPLICATION DEPLOYMENT AND/OR EXECUTION IN MULTI-CLOUD COMPUTING ENVIRONMENT	10/30/2017	15/797,564
EMC IP Holding Company LLC	CONTAINER LIFE CYCLE MANAGEMENT WITH HONEYPOT SERVICE	10/30/2017	15/797,597
EMC IP Holding Company LLC	CONTAINER LIFE CYCLE MANAGEMENT WITH RETENTION RATE ADJUSTMENT BASED ON DETECTED ANOMALIES	10/30/2017	15/797,601
EMC IP Holding Company LLC	CONTAINER LIFE CYCLE MANAGEMENT WITH SESSION DILUTION TIME	10/30/2017	15/797,609
EMC IP Holding Company LLC	SYSTEMS AND METHODS OF RUNNING DIFFERENT FLAVORS OF A SERVICE PROVIDER IN DIFFERENT HOST	10/30/2017	15/797,640

Owner	Title	Date	Application No.
	ENVIRONMENTS		
EMC IP Holding Company LLC	CONTENT STORAGE MANAGEMENT BASED ON MULTI-DIMENSIONAL VALUATION MODELS	10/30/2017	15/797,663
EMC IP Holding Company LLC	SYSTEMS AND METHODS OF SERVERLESS MANAGEMENT OF DATA MOBILITY DOMAINS	10/30/2017	15/797,691
EMC IP Holding Company LLC	INTELLIGENT REST CLIENT FOR OPERATING A DATA STORAGE SYSTEM	10/30/2017	15/797,738
EMC IP Holding Company LLC	IO WORKLOAD SELECTION AND PRIORITIZATION IN DATA MIRRORING ENVIRONMENTS	10/30/2017	15/797,739
EMC IP Holding Company LLC	SELECTIVELY LIMITING THROUGHPUT OF TEST OBJECTS THAT SHARE SYSTEM RESOURCES WITH PRODUCTION OBJECTS	10/31/2017	15/798,558
EMC IP Holding Company LLC	AVOIDING DATA-LOG BYPASS TO PROMOTE INLINE DEDUPLICATION DURING COPIES	10/31/2017	15/798,580
EMC IP Holding Company LLC	LAYERED DATA PATH ARCHITECTURE FOR DATA PROTECTION AND MOBILITY	10/31/2017	15/798,604
EMC IP Holding Company LLC	STORAGE SYSTEM WITH DISTRIBUTED INPUT-OUTPUT SEQUENCING	10/31/2017	15/798,605
EMC IP Holding Company LLC	STORAGE SYSTEM WITH SELECTABLE CACHED AND CACHELESS MODES OF OPERATION FOR DISTRIBUTED STORAGE VIRTUALIZATION	10/31/2017	15/798,632
EMC IP Holding Company LLC	METHOD AND MECHANISM FOR COMPOSITE DATA SERVICE GENERATION AND IMPLEMENTATION	10/31/2017	15/798,694
EMC IP Holding Company LLC	OPTIMIZING INLINE DEDUPLICATION DURING COPIES	10/31/2017	15/798,740
EMC IP Holding Company LLC	ENHANCED COOKIE MANAGEMENT FOR FILE WORKFLOWS	10/31/2017	15/798,746
EMC IP Holding Company LLC	VIRTUAL DATA MANAGEMENT SERVICES	10/31/2017	15/798,751
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR DISK ARRAY TO INTEGRATE DUAL-PORT NVME DRIVES AND DRAM TO IMPLEMENT A UNIFIED CACHE FOR USER IO ACCELERATION	10/31/2017	15/798,775
EMC IP Holding Company LLC	ACCELERATING DATA REDUCTION THROUGH REINFORCEMENT LEARNING	10/31/2017	15/798,943
EMC IP Holding Company LLC	STORAGE ELEMENT CLONING IN PRESENCE OF DATA STORAGE PRE-MAPPER WITH MULTIPLE SIMULTANEOUS INSTANCES OF VOLUME ADDRESS	10/31/2017	15/799,063
EMC IP Holding Company LLC	PARALLEL ACCESS VOLUME I/O PROCESSING WITH INTELLIGENT ALIAS SELECTION ACROSS LOGICAL CONTROL	10/31/2017	15/799,070

Owner	Title	Date	Application No.
	UNITS		
EMC IP Holding Company LLC	AUTOMATED AGENT FOR DATA COPIES VERIFICATION	10/31/2017	15/799,088
EMC IP Holding Company LLC	MAPPED RAID ADAPTIVE WEAR BALANCING	10/31/2017	15/799,090
EMC IP Holding Company LLC	SPEEDING DEDUPLICATION USING A MOST WANTED DIGEST CACHE	10/31/2017	15/799,117
EMC IP Holding Company LLC	METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR MANAGING DATA STORAGE	10/31/2017	15/799,175
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR USING WEAR-LEVELING USING A MULTI-GAP PROGRESS FIELD	10/31/2017	15/799,225
EMC IP Holding Company LLC	METHOD AND APPARATUS FOR PROVIDING ACCURATE AND AUTOMATIC QUALITY OF SERVICE SETTINGS USING PREDICTION MODELING AND MACHINE LEARNING	10/31/2017	15/799,277
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR DISTRIBUTED ANALYSIS	10/31/2017	15/799,314
EMC IP Holding Company LLC	MULTI-FRAMEWORK DISTRIBUTED COMPUTATION	10/31/2017	15/799,389
EMC IP Holding Company LLC	ANOMALY SCORE GENERATION BASED ON ADAPTIVE CLUSTERING OF USER LOCATION	11/1/2017	15/800,506
EMC IP Holding Company LLC	SIMULATION-BASED ONLINE OPTIMIZATION OF WORKFLOWS	11/1/2017	15/800,587
EMC IP Holding Company LLC	REPORTING OF SPACE SAVINGS DUE TO PATTERN MATCHING IN STORAGE SYSTEMS	11/1/2017	15/800,590
EMC IP Holding Company LLC	ANALYTICALLY GENERATED MICRO-SERVICE CONSUMER-DRIVEN CONTRACTS AND AUTOMATED TESTS	11/1/2017	15/800,593
EMC IP Holding Company LLC	ELECTRONIC AGREEMENT DATA MANAGEMENT ARCHITECTURE WITH BLOCKCHAIN DISTRIBUTED LEDGER	11/1/2017	15/800,897
EMC IP Holding Company LLC	PERSISTENT CACHE LAYER LOCKING COOKIES	11/2/2017	15/801,718
EMC IP Holding Company LLC	BACKUP WITHIN A FILE SYSTEM USING A PERSISTENT CACHE LAYER TO TIER DATA TO CLOUD STORAGE	11/2/2017	15/801,746
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR STORAGE SYSTEM AUTOTIERING USING ADAPTIVE GRANULARITY	11/3/2017	15/802,513
EMC IP Holding Company LLC	UNIFORM PARSING OF CONFIGURATION FILES FOR MULTIPLE PRODUCT TYPES	11/3/2017	15/802,550
EMC IP Holding Company LLC	CONTROLLED DISTRIBUTION OF FILES BASED ON DESIGNATED MACHINE FEED TYPE	11/3/2017	15/802,559
EMC IP Holding	AGGREGATING NETWORK SESSIONS	11/3/2017	15/802,576

Owner	Title	Date	Application No.
Company LLC	INTO META-SESSIONS FOR RANKING AND CLASSIFICATION		
EMC IP Holding Company LLC	ENHANCING DATA BACKUP AND RECOVERY PERFORMANCE	11/3/2017	15/802,606
EMC IP Holding Company LLC	COMPILER FOR MULTI-CLOUD FUNCTION-AS-A-SERVICE ENVIRONMENT	11/3/2017	15/802,692
EMC IP Holding Company LLC	PRIORITY-BASED ARTIFACT ROUTING	11/3/2017	15/802,917
EMC IP Holding Company LLC	CENTRALIZING ENTERPRISE-SPECIFIC INFORMATION ACROSS CLOUD-BASED SYSTEMS	11/3/2017	15/802,928
EMC IP Holding Company LLC	INTELLIGENT RESOURCE MATCHING FOR REQUEST ARTIFACTS	11/3/2017	15/802,935
EMC IP Holding Company LLC	MANAGING APPLICATIONS ON SERVERS AND STORAGE SYSTEMS	11/3/2017	15/803,303
EMC IP Holding Company LLC	RECOVERING LOG-STRUCTURED FILESYSTEMS FROM PHYSICAL REPLICAS	11/3/2017	15/803,468
EMC IP Holding Company LLC	SMART NAMESPACE SSD CACHE WARMUP FOR STORAGE SYSTEMS	9/26/2017	15/716,325
EMC IP Holding Company LLC	FEDERATED ANALYTICS	9/1/2017	62/553,364
EMC IP Holding Company LLC	MITIGATING CAUSALITY DISCREPANCIES CAUSED BY STALE VERSIONING	9/8/2017	62/555,733
EMC IP Holding Company LLC	SCALABLE METHOD FOR MALWARE DETECTION USING MULTIPLE DATA SOURCES	10/6/2017	62/569,158

#### Granted U.S. Patents

Owner	Title	Date	Patent No.
Dell Products L.P.	SYSTEMS AND METHODS FOR PROVIDING CONNECTIONS TO AN INFORMATION HANDLING SYSTEM	8/15/2017	9734106
Dell Products L.P.	SHOCK PALLET WITH ADJUSTABLE ANTI-TIP MECHANISM	9/12/2017	9758277
Dell Products L.P.	MULTI-CHANNEL AUDIO POSITIONAL LIGHTING	9/12/2017	9763021
Dell Products L.P.	METHOD AND APPARATUS FOR OPTIMIZING END TO END RADIO COMMUNICATION MANAGEMENT FOR USERS WITH MULTIPLE DEVICES	10/31/2017	9807641
EMC Corporation	SONIFICATION OF PERFORMANCE METRICS	8/15/2017	9734674
EMC Corporation	IMPROVING SNAPSHOT EFFICIENCY	8/22/2017	9740632
EMC Corporation	GUIDE WORD PAGED HASH TABLE	8/29/2017	9747164

Owner	Title	Date	Patent No.
EMC Corporation	MONITORED SYSTEM EVENT PROCESSING AND IMPACT CORRELATION	9/5/2017	9755938
EMC Corporation	CHECKPOINT BLOCK STORAGE DEVICE	9/19/2017	9766990
EMC Corporation	METHOD AND SYSTEM FOR IMPROVING FLASH STORAGE PERFORMANCE FOR VARIOUS TYPES OF WORKLOADS BY MODULATING OPERATING TEMPERATURE	10/24/2017	9798334
EMC Corporation	EXTENT LEVEL CACHE DESTAGING	10/24/2017	9798472
EMC IP Holding Company LLC	OUT-OF-CORE SIMILARITY MATCHING	8/8/2017	9727573
EMC IP Holding Company LLC	NON-DISRUPTIVE LOAD-BALANCING OF VIRTUAL MACHINES BETWEEN DATA CENTERS	8/15/2017	9733989
EMC IP Holding Company LLC	DATA COPY AVOIDANCE ACROSS A STORAGE	8/15/2017	9734074
EMC IP Holding Company LLC	METHOD AND APPARATUS FOR AUTOMATED DATA PROTECTION WITH IT INFRASTRUCTURE VISIBILITY	8/15/2017	9736007
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR MAINTAINING CONSISTENT POINTS IN FILE SYSTEMS	8/22/2017	9740565
EMC IP Holding Company LLC	WIRELESS WEARABLE AUTHENTICATORS USING ATTACHMENT TO CONFIRM USER POSSESSION	8/22/2017	9740844
EMC IP Holding Company LLC	ENCRYPTED VIRTUAL MACHINES IN A CLOUD	8/22/2017	9740880
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR MACHINE LEARNING FOR WRITE COMMAND SELECTION BASED ON TECHNOLOGY FEEDBACK	8/29/2017	9747040
EMC IP Holding Company LLC	RECOVERY MECHANISM FOR FAULT-TOLERANT SPLIT-SERVER PASSCODE VERIFICATION OF ONE-TIME AUTHENTICATION TOKENS	8/29/2017	9749314
EMC IP Holding Company LLC	TRIANGULAR ASYNCHRONOUS REPLICATION	9/5/2017	9753663
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR PARENT BACKUP APPLICATION DRIVING OF CHILDREN BACKUP APPLICATIONS	9/5/2017	9753672
EMC IP Holding Company LLC	DISTRIBUTED DYNAMIC FEDERATION BETWEEN MULTI-CONNECTED VIRTUAL PLATFORM CLUSTERS	9/5/2017	9753761
EMC IP Holding Company LLC	CENTRALIZED EMPLOYEE DATA ANALYTICS	9/5/2017	9754233
EMC IP Holding Company LLC	PARALLEL FILE SYSTEM WITH METADATA DISTRIBUTED ACROSS PARTITIONED KEY-VALUE STORE	9/19/2017	9767107
EMC IP Holding Company LLC	END-TO-END DATA INTEGRITY IN PARALLEL STORAGE	9/19/2017	9767139
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR IMPROVING DATA COMPRESSION OF A STORAGE SYSTEM IN AN ONLINE MANNER	9/19/2017	9767154



Owner	Title	Date	Patent No.
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR ACCELERATING DATA MOVEMENT USING CHANGE INFORMATION CONCERNING DIFFERENCE BETWEEN CURRENT AND PREVIOUS DATA MOVEMENTS	9/26/2017	9773042
EMC IP Holding Company LLC	HYPER-CONVERGED INFRASTRUCTURE BASED ON SERVER PAIRS	10/3/2017	9778865
EMC IP Holding Company LLC	AUTHENTICATING AN ENTITY	10/3/2017	9781129
EMC IP Holding Company LLC	MANAGING POLICIES	10/3/2017	9781130
EMC IP Holding Company LLC	REPLICATION OPTIMIZED IO	10/24/2017	9798490
EMC IP Holding Company LLC	USING DYNAMIC I/O LOAD DIFFERENTIAL FOR LOAD BALANCING	10/31/2017	9804797
EMC IP Holding Company LLC	EFFICIENT PRODUCTION RECOVERY	10/31/2017	9804934
EMC IP Holding Company LLC	UNIFIED AND SECURED ENTERPRISE MOBILITY PLATFORM	10/31/2017	9807165
Wyse Technology L.L.C.	STATE-BASED PROVISIONING OF A CLIENT HAVING A WINDOWS-BASED EMBEDDED IMAGE	9/12/2017	9762440