PATENT ASSIGNMENT COVER SHEET

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	RELEASE OF SECURITY INTEREST IN PATENTS PREVIOUSLY RECORDED AT REEL/FRAME (047648/0422)

CONVEYING PARTY DATA

Name	Execution Date
THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., AS NOTES COLLATERAL AGENT	03/29/2022

RECEIVING PARTY DATA

Name:	DELL PRODUCTS L.P.
Street Address:	ONE DELL WAY
City:	ROUND ROCK
State/Country:	TEXAS
Postal Code:	78682
Name:	EMC CORPORATION
Street Address:	176 SOUTH STREET
City:	HOPKINTON
State/Country:	MASSACHUSETTS
Postal Code:	01748
Name:	EMC IP HOLDING COMPANY LLC
Street Address:	ONE DELL WAY
City:	ROUND ROCK
State/Country:	TEXAS
Postal Code:	78682

PROPERTY NUMBERS Total: 507

Property Type	Number
Patent Number:	10037386
Patent Number:	10037156
Patent Number:	10037427
Patent Number:	10038761
Patent Number:	10037289
Patent Number:	10031675
Patent Number:	10031794
Patent Number:	10031962
Patent Number:	10031703

Property Type	Number
Patent Number:	10025510
Patent Number:	10027546
Patent Number:	10025523
Patent Number:	10019194
Patent Number:	10019401
Patent Number:	10015180
Patent Number:	10013200
Patent Number:	10013364
Patent Number:	10015171
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Patent Number:	10013425
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Patent Number:	10002087
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Patent Number:	9996291
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Patent Number:	9986023
Patent Number:	9983937
Patent Number:	9983896
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Patent Number:	9983931
Patent Number:	10061697
Patent Number:	9977718
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Property Type	Number
Patent Number:	10049012
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Application Number:	15972137
Application Number:	15972136
Application Number:	15973234
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Application Number:	15972901
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Application Number:	15631572
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Application Number:	15636454
Application Number:	15636470

Property Type	Number
Application Number:	15637080
Application Number:	15638330
Application Number:	15639589
Application Number:	15881028

CORRESPONDENCE DATA

Fax Number: (212)455-2502

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: 2124552333
Email: jmull@stblaw.com
Correspondent Name: BOBBIE BURROWS
Address Line 1: 425 LEXINGTON AVENUE
Address Line 4: NEW YORK, NEW YORK 10017

ATTORNEY DOCKET NUMBER:	085706/0586
NAME OF SUBMITTER:	J. JASON MULL
SIGNATURE:	/J. Jason Mull/
DATE SIGNED:	05/20/2022

Total Attachments: 34

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NOTICE OF TERMINATION AND RELEASE OF SECURITY INTEREST IN PATENT RIGHTS

This NOTICE OF TERMINATION AND RELEASE (this "Release"), dated as of March 29, 2022 (the "Effective Date"), is made by THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., in its capacity as Notes Collateral Agent (the "Agent"), with respect to the grantor parties identified on the signature page hereto (each individually, a "Grantor," collectively the "Grantors").

WHEREAS, pursuant to the Indenture, dated as of June 1, 2016 (as amended and/or supplemented to the date hereof), among the Agent, the Grantor and certain other parties thereto (the "Indenture") and that certain Security Agreement, dated as of September 7, 2016 by and among the Agent, the Grantor and certain other parties thereto (as amended, amended and restated, or otherwise modified from time to time, the "Security Agreement"), the Grantor granted to the Agent a security interest in and to certain collateral, including Patents;

WHEREAS, pursuant to the Security Agreement, the Grantor executed and delivered a Patent Security Agreement, dated as of September 6, 2018 (the "Patent Security Agreement"), for recordal with the United States Patent and Trademark Office;

WHEREAS, the Patent Security Agreement was recorded with the United States Patent and Trademark Office on October 12, 2018 at Reel 47648 and Frame 0422;

WHEREAS, the security interest was terminated and released by the Agent on November 1, 2021, in accordance with the terms of the Indenture and the Security Agreement;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Agent hereby agrees as follows:

Defined Terms. All capitalized terms used, but not otherwise defined herein, shall have the respective meanings ascribed in or otherwise referenced in the Patent Security Agreement or the Security Agreement, as applicable.

Release. The Agent, without recourse, representation or warranty of any kind, hereby disclaims, releases, discharges, terminates and cancels any security interest in and to the Patent Collateral, including the Patents set forth in Schedule 1 attached hereto (the "Released Patents") arising from the Security Agreement and the recordation of the Patent Security Agreement and reassigns all right, title and interest it has in the Released Patents to the Grantor.
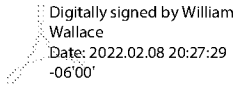
Further Assurances. Promptly upon request by the Grantor from time to time, the Agent agrees to take all further actions, and provide to the Grantor and its successors, assigns or other legal representatives, all such cooperation and assistance (including, without limitation, the execution and delivery of any and all documents or other instruments), reasonably requested by the Grantor, at the Grantor's sole cost and expense, to more fully and effectively effectuate the purposes of this Release.

     <u>Governing Law</u>. This Release shall be governed by and construed in accordance with the laws of the State of New York, and shall be binding on the Grantor's and the Agent's representatives, successors, assigns and transferees.
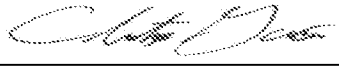
[Remainder of this page intentionally left blank]

IN WITNESS WHEREOF, the Agent has caused this Release to be executed by its duly authorized representative as of the Effective Date:

THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., not in its individual capacity but solely acting in its capacity as Agent for the Secured Parties

By: William Wallace

Digitally signed by William Wallace
Date: 2022.02.08 20:27:29 -06'00'

Name: William Wallace

Title: Vice President

GRANTOR(s)
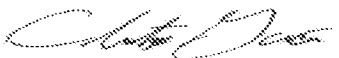
Dell Products L.P.

By: _____
    Name: Christopher Garcia
    Title: Senior Vice President &
    Assistant Secretary

EMC Corporation

By: _____
    Name: Christopher Garcia
    Title: Senior Vice President &
    Assistant Secretary

EMC IP Holding Company LLC

By: _____
    Name: Christopher Garcia
    Title: Senior Vice President &
    Assistant Secretary

SCHEDULE I
U.S. Patent Applications

Owner	Title	Date	Application No.
Dell Products L.P.	SYSTEMS AND METHODS FOR ADAPTIVE PROACTIVE FAILURE ANALYSIS FOR MEMORIES	5/5/2018	15/972137
Dell Products L.P.	SYSTEMS AND METHODS FOR BOOTING FROM VIRTUAL VOLUME SPANNED ACROSS UNKNOWN NUMBER OF STORAGE DEVICES	5/5/2018	15/972136
Dell Products L.P.	CHASSIS OUTER SURFACE SUPPLEMENTAL PASSIVE COOLING SYSTEM	5/7/2018	15/973234
Dell Products L.P.	FORCED CONVECTION COOLING SYSTEM	5/7/2018	15/973203
Dell Products L.P.	System and Method to Update Operating System Services	5/7/2018	15/972901
Dell Products L.P.	System and Method to Deploy or Update Operating System Service Capabilities	5/7/2018	15/972893
Dell Products L.P.	Information Handling System with High Current Battery Planar Tab Interconnect	5/8/2018	15/974249
Dell Products L.P.	System and Method for Managing a Rechargeable Battery Based on Historical Charging Data	5/9/2018	15/974761
Dell Products L.P.	System and Method to Learn and Prescribe Optimal Network Path for SDN	5/10/2018	15/976361
Dell Products L.P.	System and Method to Manage Versioning and Modifications of Content in a Centralized Content Handling System	5/10/2018	15/976420
Dell Products L.P.	Method to Dynamically Create Plug and Play Identifiers in Firmware to Facilitate Deployment of Windows Services	5/10/2018	15/976454
Dell Products L.P.	Power Adapter	5/11/2018	29/647256
Dell Products L.P.	Display Stand	5/11/2018	29/647255
Dell Products L.P.	Mouse Peripheral	5/11/2018	29/647257
Dell Products L.P.	Information Handling System with Thin Flex Hinge	5/14/2018	15/978629
Dell Products L.P.	Detecting An Error Message and Automatically Presenting Links to Relevant Solution Pages	5/14/2018	15/978800
Dell Products L.P.	Method to implement real and virtual peripheral vision in AR	5/14/2018	15/978365
Dell Products L.P.	SYSTEMS AND METHODS FOR AUTOMATIC ADJUSTMENT FOR VERTICAL AND ROTATIONAL IMBALANCE IN AUGMENTED AND VIRTUAL REALITY HEAD-MOUNTED DISPLAYS	5/14/2018	15/978827
Dell Products L.P.	Systems and Methods to Assign Variable Delays for Processing Computer System Updates	5/14/2018	15/978654

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[Schedule to Patent Security Agreement]

Owner	Title	Date	Application No.
Dell Products L.P.	Airflow Sealing by Flexible Rubber with I- beam and Honeycomb Structure	5/15/2018	15/980282
Dell Products L.P.	Voice Analytics for Technicians	5/15/2018	15/979598
Dell Products L.P.	Improving Customer Care	5/15/2018	15/979626
Dell Products L.P.	Tamper Proof Dual Boot Architecture	5/16/2018	15/981370
Dell Products L.P.	System and Method for Key Management in Computing Clusters	5/17/2018	15/983021
Dell Products L.P.	Information Handling System with Sensor Activated Battery Charge Level Indicator	5/17/2018	15/983018
Dell Products L.P.	Method for Updating Firmware of Unassigned Drives	5/23/2018	15/987036
Dell Products L.P.	EXPANSION MODULE SYSTEM	5/23/2018	15/987752
Dell Products L.P.	System and Method of Utilizing Memory Modules	5/23/2018	15/987190
Dell Products L.P.	Splitting and/or Grouping Items in an Order Based on Rules	5/24/2018	15/988557
Dell Products L.P.	Structure and Method for Securing and Transporting Equipment Racks	5/25/2018	15/989250
Dell Products L.P.	System and Method for Policy Based Wireless Docking Access and Prioritization	5/29/2018	15/991882
Dell Products L.P.	System and Method for Providing Wireless Power in a Removable Wireless Charging Module	5/30/2018	15/993358
Dell Products L.P.	System and Method to Manage File Access Rights in an Information Handling System	5/30/2018	15/993388
Dell Products L.P.	METHOD AND DEVICE FOR DEDUPLICATION	5/30/2018	15/992483
Dell Products L.P.	Leveraging Server Resources for Storage Array Performance Enhancements	5/31/2018	15/994462
Dell Products L.P.	MULTI-STANDARD CHASSIS SECURITY SLOT FOR INFORMATION HANDLING SYSTEMS	5/31/2018	15/994782
Dell Products L.P.	Usage Profile Based Recommendations	5/31/2018	15/994406
Dell Products L.P.	IMPROVE AVAILABILITY OF A MEMORY SYSTEM	5/31/2018	15/994354
Dell Products L.P.	METHOD AND DEVICE FOR DISPATCHING REPLICATION TASKS IN NETWORK STORAGE DEVICE	5/31/2018	15/993852
Dell Products L.P.	METHOD AND DEVICE FOR FILE SYSTEM LOG	5/31/2018	15/993791
Dell Products L.P.	METHOD, SYSTEM AND COMPUTER PROGRAM PRODUCT FOR MANAGING STORAGE SYSTEM	5/31/2018	15/993719
Dell Products L.P.	Server Message Block Remote Direct Memory Access Persistent Memory Dialect	6/1/2018	15/995708

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PATENT
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Owner	Title	Date	Application No.
Dell Products L.P.	METHOD AND DEVICE FOR DATA READ AND WRITE	6/1/2018	15/995192
Dell Products L.P.	METHOD AND DEVICES FOR MANAGING CACHE	6/1/2018	15/995386
Dell Products L.P.	System and Method for Performing Wear Leveling at a Non-Volatile Firmware Memory	6/3/2018	15/997164
Dell Products L.P.	METHOD AND DEVICE FOR DATA DUPLICATION CUTOVER	6/4/2018	15/996690
Dell Products L.P.	SYSTEMS AND METHODS FOR MOUNTING AIR MOVER TO CREATE THERMAL SEAL AND MINIMIZE VIBRATIONAL NOISE	6/5/2018	16/000222
Dell Products L.P.	Systems and Methods for Carrier-Less Storage Device Extraction in an Information Handling System	6/7/2018	16/002979
Dell Products L.P.	360 static/hinge structure with deformable parts	6/8/2018	16/003197
Dell Products L.P.	SYSTEMS AND METHODS FOR TRIGGERING USER INTERFACE TOAST NOTIFICATIONS FOR HYBRID APPLICATIONS	6/8/2018	16/003401
Dell Products L.P.	SYSTEMS AND METHODS FOR PROCESSING OF PHYSICAL INTERACTION WITH INTERFACE DEVICE OF INFORMATION HANDLING SYSTEM BASED ON SENSOR INFORMATION INDICATIVE OF HUMAN PROXIMITY	6/11/2018	16/004732
Dell Products L.P.	Method and Apparatus for Ensuring Data Integrity in a Storage Cluster With the Use of NVDIMM	6/11/2018	16/004822
Dell Products L.P.	Systems and Methods to Prevent System Crashes Due to Link Failure in Memory Mirroring Mode	6/11/2018	16/004996
Dell Products L.P.	AUTHENTICATION AND AUTHORIZATION OF USERS IN AN INFORMATION HANDLING SYSTEM BETWEEN BASEBOARD MANAGEMENT CONTROLLER AND HOST OPERATING SYSTEM USERS	6/11/2018	16/004484
Dell Products L.P.	BOOST ASSIST METADATA TABLES	6/12/2018	16/005935
	FOR PERSISTENT MEMORY DEVICE UPDATES DURING A HARDWARE FAULT		
Dell Products L.P.	System and Method for Service Discovery in a Large Network	6/13/2018	16/007378
Dell Products L.P.	Method and Apparatus for Drift Management in Clustered Environments	6/13/2018	16/007422
Dell Products L.P.	A deterministic method to capture OS crash/panic screen and serial data for post-crash analysis	6/13/2018	16/006972
Dell Products L.P.	METHOD AND APPARATUS FOR PROVIDING INTERFACE BETWEEN DEDICATED DISCRETE GRAPHICS PROCESSING UNIT AND HEAD	6/13/2018	16/007909

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Owner	Title	Date	Application No.
	MOUNTED DISPLAY USING TYPE-C UNIVERSAL STANDARD BUS		
Dell Products L.P.	Methods and Apparatus to Enable Services to Run in Multiple Security Contexts	6/13/2018	16/007414
Dell Products L.P.	Method and Apparatus for Gross-Level User and Input Detection Using Similar or Dissimilar Camera Pair	6/14/2018	16/009168
Dell Products L.P.	Generalized Adaptive solution for storage.	6/14/2018	16/008832
Dell Products L.P.	System and Method of Configuring One or More Memory Media	6/14/2018	16/008506
Dell Products L.P.	System and Method of Communicating Errors of Information Handling Systems	6/14/2018	16/008403
Dell Products L.P.	"System and Method to Perform or Enhance Gesture Sequence Recognition and Tracking Using SLAM in xR HMDs"	6/14/2018	16/009087
Dell Products L.P.	System and Method to Control UI or Application Using Two Handed Gesture Sequences in xR HMDs	6/14/2018	16/009057
Dell Products L.P.	System and Method to Control UI or Application Using Single Hand Gesture Sequences in xR HMDs	6/14/2018	16/009029
Dell Products L.P.	"System and Method for Recognizing and Differentiating Between One-Handed and Two-Handed Gesture Sequences in xR HMDs"	6/14/2018	16/008982
Dell Products L.P.	Multi-mode bi-directional direct communications between co-located AR HMDs	6/14/2018	16/008888
Dell Products L.P.	Method to Optimize XR HMD Performance by transitioning between different Methods of Tracking	6/14/2018	16/008831
Dell Products L.P.	Method for Scalability and Real-Time Adaptation of Inside-Out SLAM in AR HMDs Tethered to IHS	6/14/2018	16/008727
Dell Products L.P.	SEMI-SOLID HINGE COVER	6/15/2018	16/009248
Dell Products L.P.	System and Method for Managing UEFI Boot Device Path Based on Custom Selection	6/15/2018	16/009510
Dell Products L.P.	CONFIGURABLE ALL-IN-ONE MODULAR DESKTOP COMPUTING SYSTEM	6/15/2018	16/010195
Dell Products L.P.	EXTERNALLY MOUNTED COMPONENT COOLING SYSTEM	6/15/2018	16/010013
Dell Products L.P.	System and Method for Coordinate System Override for "See What I See" for any model rendered on PC	6/15/2018	16/009623
Dell Products L.P.	Method and Apparatus for Identifying and Reporting Faults at an Information Handling System	6/19/2018	16/012324
Dell Products L.P.	Method and Apparatus for Determining Treatment of Cross-Screen Content for a Dual Segmented Display	6/19/2018	16/012312

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PATENT
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Owner	Title	Date	Application No.
Dell Products L.P.	Method and Apparatus for Non-Volatile Memory Array Improvement Using a Command Aggregation Circuit	6/20/2018	16/013466
Dell Products L.P.	SECURE LIVE MEDIA BOOT SYSTEM	6/21/2018	16/014561
Dell Products L.P.	POWER SUPPLY UNIT MISMATCH DETECTION SYSTEM	6/21/2018	16/014825
Dell Products L.P.	Apparatus and Method to Execute Prerequisite Code Before Delivering UEFI Firmware Capsule	6/21/2018	16/014686
Dell Products L.P.	System to enhance and extend PC's voice assistant functions to anywhere	6/21/2018	16/014468
Dell Products L.P.	New Fitness Check Boot Menu Function Key to ensure Parts are Optimally installed on the server	6/22/2018	16/015687
Dell Products L.P.	Keyboard for Provisioning Security Credentials	6/25/2018	16/017036
Dell Products L.P.	System and Method of Displaying Watermarks	6/25/2018	16/017616
Dell Products L.P.	Apparatus and Methods For Mounting Information Handling System Hardware Components	6/25/2018	16/017372
Dell Products L.P.	System and Method of Allocating Storage of Devices	6/25/2018	16/017189
Dell Products L.P.	Systems and Methods for Fan Typing and Anomaly Detection	6/25/2018	16/017222
Dell Products L.P.	Providing Recommendation(s) for a Computing Device Executing a Gaming Application	6/25/2018	16/016970
Dell Products L.P.	Secure and Portable License Management for Datacenter Using Blockchain with Smart-Contract Tokens	6/26/2018	16/018564
Dell Products L.P.	Under Motherboard Fresh Air Cooling Plenum	6/26/2018	16/018233
Dell Products L.P.	SYSTEMS AND METHODS FOR MIGRATION OF COMPUTING RESOURCES BASED ON INPUT/OUTPUT DEVICE PROXIMITY	6/26/2018	16/018896
Dell Products L.P.	SYSTEMS AND METHODS FOR EXTENDING LINK LAYER DISCOVERY OVER VIRTUAL ETHERNET BRIDGES	6/27/2018	16/020070
Dell Products L.P.	Retractable Touchpad Button Bumper	6/27/2018	16/019853
Dell Products L.P.	Digital Pen with 3D radial interface input	6/28/2018	16/021255
Dell Products L.P.	System and Method of Utilizing Audio Orientations	6/28/2018	16/021559
Dell Products L.P.	Information Handling System Touch Device with Automatically Orienting Visual Display	6/28/2018	16/021714
Dell Products L.P.	Information Handling System Touch Device with Visually Interactive Region	6/28/2018	16/021695
Dell Products L.P.	Information Handling System Touch Device False Touch Detection and Mitigation	6/28/2018	16/021655

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Owner	Title	Date	Application No.
Dell Products L.P.	Information Handling System Touch Device with Adaptive Haptic Response	6/28/2018	16/021645
Dell Products L.P.	Information Handling System Touch Device Context Aware Input Tracking	6/28/2018	16/021608
Dell Products L.P.	Information Handling System Dynamic Friction Touch Device for Touchscreen Interactions	6/28/2018	16/021578
Dell Products L.P.	Classifying Telemetry Data to Identify and Remediate Issues	6/28/2018	16/021171
Dell Products L.P.	CACHE MANAGEMENT METHOD, STORAGE SYSTEM AND COMPUTER PROGRAM PRODUCT	6/28/2018	16/021734
Dell Products L.P.	METHOD AND DEVICE FOR CACHE MANAGEMENT	6/28/2018	16/021719
Dell Products L.P.	METHOD AND DEVICE FOR MANAGING STORAGE SYSTEM	6/28/2018	16/021699
Dell Products L.P.	STORAGE MANAGEMENT METHODS AND SYSTEMS	6/28/2018	16/021673
Dell Products L.P.	METHOD AND DEVICE FOR STORAGE MANAGEMENT	6/28/2018	16/021651
Dell Products L.P.	METHOD, DEVICE AND COMPUTER PROGRAM PRODUCT FOR MANAGING A STORAGE SYSTEM	6/28/2018	16/021636
Dell Products L.P.	METHODS AND DEVICES FOR MANAGING CACHE	6/28/2018	16/021614
Dell Products L.P.	METHOD AND DEVICE FOR CACHE MANAGEMENT	6/28/2018	16/021597
Dell Products L.P.	METHOD F STORAGE MANAGEMENT, STORAGE SYSTEM AND COMPUTER PROGRAM PRODUCT PRODUCT	6/28/2018	16/021286
Dell Products L.P.	METHOD, DEVICE AND COMPUTER PROGRAM PRODUCT FOR MANAGING STORAGE SYSTEM	6/28/2018	16/021276
Dell Products L.P.	COMMUNICATIONS BETWEEN VIRTUAL DUAL CONTROL MODULES IN VIRTUAL MACHINE ENVIRONMENT	6/28/2018	16/021262
Dell Products L.P.	METHOD AND DEVICE FOR MANAGING STATEFUL APPLICATION ON SERVER	6/28/2018	16/021236
Dell Products L.P.	System and method for design of high speed signaling and power delivery	6/29/2018	16/023740
Dell Products L.P.	Systems and Methods for Preventing Leakage of Protected Document Data	7/2/2018	16/025193

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Owner	Title	Date	Application No.
Dell Products L.P.	SYSTEMS AND METHODS FOR PROVIDING MULTI-USER LEVEL AUTHORIZATION ENABLED BIOS ACCESS CONTROL	7/5/2018	16/027913
Dell Products L.P.	Proximity-based authorization for encryption and decryption services	7/5/2018	16/027655
Dell Products L.P.	System and Method of Utilizing a Watchdog Timer	7/6/2018	16/029271
Dell Products L.P.	A System and Method to provide a secured Shared Memory Access at OS Runtime.	7/9/2018	16/030456
Dell Products L.P.	System and Method for Scalability and Real-Time Adaptation of Gesture Tracking in AR HMDs Tethered to IHS	7/10/2018	16/031118
Dell Products L.P.	System and Method of Utilizing Augmented Reality in Various Contexts	7/10/2018	16/031796
Dell Products L.P.	SYSTEMS AND METHODS FOR OPTIMAL CONFIGURATION OF INFORMATION HANDLING RESOURCES	7/12/2018	16/034047
Dell Products L.P.	System and Method for Calibration and Modification of AR/VR HMD Display/Overlay for Color Blindness	7/12/2018	16/033351
Dell Products L.P.	System and Method for Calibration, Analysis and Notification of Environmental Safety Events in AR HMDs	7/12/2018	16/033307
Dell Products L.P.	SYSTEMS AND METHODS FOR OPTIMAL PLACEMENT OF INFORMATION HANDLING RESOURCE	7/12/2018	16/034001
Dell Products L.P.	FIBRE CHANNEL FORWARDER LOAD BALANCING SYSTEM	7/13/2018	16/034758
Dell Products L.P.	System and Method of Multiplexing Communications	7/13/2018	16/035194
Dell Products L.P.	REMOTE ACCESS CONTROLLER IN- BAND ACCESS SYSTEM	7/13/2018	16/034747
Dell Products L.P.	INTER-DATACENTER MULTICAST SYSTEM	7/13/2018	16/035219
Dell Products L.P.	SYSTEMS AND METHODS FOR MANUFACTURING STRUCTURAL MATERIALS	7/16/2018	16/035972
Dell Products L.P.	SYSTEMS AND METHODS FOR CONFIGURING NETWORK INTERFACE AFFINITY TO SYSTEM MANAGEMENT FEATURES SUPPORTED BY A MANAGEMENT CONTROLLER	7/16/2018	16/036154
Dell Products L.P.	Method to Secure UWP App Services between UWP clients and Win32 services	7/16/2018	16/035943
Dell Products L.P.	System and Method of Managing Battery Systems	7/16/2018	16/036555
Dell Products L.P.	Predicting a Success Rate of Deploying a Software Bundle	7/16/2018	16/036102

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Owner	Title	Date	Application No.
Dell Products L.P.	Detecting Personally Identificable Information (PII) in Telemetry Data	7/17/2018	16/037079
Dell Products L.P.	Method for Control and Distribution of the Amount of Power to be Lowered or Raised in a Multi-Load System	7/18/2018	16/038295
Dell Products L.P.	System and Method to Maintain Optimal System Performance While Adhering to Competing Power Cap Policies	7/18/2018	16/038260
Dell Products L.P.	System and Method to Maintain Optimal System Performance Within User Defined System Level Power Cap in a Changing Workload Environment	7/19/2018	16/039618
Dell Products L.P.	Runtime Update of Intel Server Platform Services' Node Manager Settings in BIOS EEPROM	7/20/2018	16/041186
Dell Products L.P.	FEEDBACK-BASED PACKET ROUTING SYSTEM	7/20/2018	16/041491
Dell Products L.P.	Apparatus and Method to Provide a Multi- Segment I2C Bus Exerciser/Analyzer/Fault Injector and Debug Port System	7/20/2018	16/041203
Dell Products L.P.	DIFFERENTIAL PAIR GROUP EQUALIZATION SYSTEM	7/20/2018	16/041315
Dell Products L.P.	COMMON INFORMATION MODEL INTEROPERABILITY SYSTEM	7/20/2018	16/041131
Dell Products L.P.	System and Method of Utilizing Peripherals	7/20/2018	16/041568
Dell Products L.P.	Systems and Methods to Build a Trusted Hypertext Transfer Protocol Secure Session on a Limited Pre-Boot Basic Input/output System Environment	7/20/2018	16/041541
Dell Products L.P.	BUFFER SHORTAGE MANAGEMENT SYSTEM	7/23/2018	16/042736
Dell Products L.P.	FIBER CHANNEL FORWARDER ROUTING SYSTEM	7/23/2018	16/042480
Dell Products L.P.	Apparatus and Method for Dynamic Modification of Machine Branding of Information Handling Systems Based on Hardware Inventory	7/23/2018	16/042217
Dell Products L.P.	FIBRE CHANNEL FORWARDER PORT CONFIGURATION SYSTEM	7/23/2018	16/042305
Dell Products L.P.	Managing Boot Failures in an Information Handling System	7/24/2018	16/043238
Dell Products L.P.	Maintaining Highest Performance of a DDRS Channel with Marginal Signal Integrity	7/24/2018	16/044278
Dell Products L.P.	Drain Aligned Cables for Next Generation Speeds	7/24/2018	16/044242
Dell Products L.P.	Apparatus and Method for Managing Part Life in a Datacenter	7/25/2018	16/045273

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PATENT
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Owner	Title	Date	Application No.
Dell Products L.P.	Apparatus and Method for Detecting Poor Component Life Zones in a Datacenter	7/25/2018	16/045326
Dell Products L.P.	Apparatus and Method for Troubleshooting Poor Part Life Zones in a Datacenter	7/25/2018	16/045334
Dell Products L.P.	SYSTEM AND METHOD TO RETAIN BASEBOARD MANAGEMENT CONTROLLER REAL-TIME CLOCK TIME DURING BMC REBOOT	7/25/2018	16/044894
Dell Products L.P.	Information Handling System Folded Display Assembly	7/26/2018	16/046040
Dell Products L.P.	AIRFLOW CHARACTERIZATION SYSTEM	7/26/2018	16/046427
Dell Products L.P.	Active Pop-up Finger Access in a Portable Information Handling System	7/26/2018	16/046024
Dell Products L.P.	Information Handling System with Memory Flush During Shut Down	7/27/2018	16/047988
Dell Products L.P.	Llearning and classifying workloads powered by enterprise infrastructure	7/27/2018	16/047206
Dell Products L.P.	Information Handling System with Modular Fan Gantry Having Different Mounting Variations	7/27/2018	16/047995
Dell Products L.P.	Method and Apparatus for Securing Add-In Cards from Firmware and Configuration Changes	7/27/2018	16/048001
Dell Products L.P.	SYSTEM AND METHOD TO MAINTAIN POWER CAP WHILE BASEBOARD MANAGEMENT CONTROLLER REBOOTS	7/27/2018	16/047361
Dell Products L.P.	Determining a Stability Index Associated with a Software Update	7/30/2018	16/048729
Dell Products L.P.	Dynamically Selecting or Creating a Policy to Throttle a Portion of Telemetry Data	7/30/2018	16/048653
Dell Products L.P.	GENERATING UNIFIED AND DYNAMICALLY UPDATABLE APPLICATION PROGRAMMING INTERFACE DOCUMENTATION FROM DIFFERENT SOURCES	7/31/2018	16/051164
Dell Products L.P.	SYSTEMS AND METHODS FOR RELIABLE REDUNDANT MANAGEMENT CONTROLLER FIRMWARE UPDATE	7/31/2018	16/050643
Dell Products L.P.	Multiform factor mobile computer with removable keyboard	7/31/2018	16/050392
Dell Products L.P.	Multiform factor mobile computer with flip out keyboard	7/31/2018	16/050494
Dell Products L.P.	Multiform factor mobile computer with virtual and removable keyboard	7/31/2018	16/050605

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Owner	Title	Date	Application No.
Dell Products L.P.	Multiform factor mobile computer with virtual and removable keyboard in adjustable positions	7/31/2018	16/050689
Dell Products L.P.	360 degree magnetic hinge element	7/31/2018	16/050816
Dell Products L.P.	System and Method for Synchronization and Streaming of Workspace Contents with Audio for Multi-user Collaborative AR HMD sessions	7/31/2018	16/050107
Dell Products L.P.	Encryption Using Wavelet Transformation	8/1/2018	16/051964
Dell Products L.P.	System and Method of Operating One or More Information Handling Systems	8/1/2018	16/052270
Dell Products L.P.	DEVICE OPERATION ANOMALY IDENTIFICATION AND REPORTING SYSTEM	8/2/2018	16/053385
Dell Products L.P.	DIFFERENTIAL PAIR CONTACT RESISTANCE ASYMMETRY COMPENSATION SYSTEM	8/2/2018	16/052879
Dell Products L.P.	MULTICAST SYSTEM	8/2/2018	16/052757
Dell Products L.P.	Apparatus and Method for Fast Memory Validation in a Baseboard Management Controller	8/2/2018	16/053436
Dell Products L.P.	Apparatus and Method to Protect an Information Handling System Against Other Devices	8/2/2018	16/053352
Dell Products L.P.	Detachable Mechanical-Based Keyboard for a Light Sensitive Keyboard	8/2/2018	16/052780
Dell Products L.P.	CIRCUIT BOARD PAD CONNECTOR SYSTEM	8/2/2018	16/052809
Dell Products L.P.	PROACTIVE HOST DEVICE ACCESS MONITORING AND REPORTING SYSTEM	8/2/2018	16/053198
Dell Products L.P.	System and Method of Configuring Information Handling Systems	8/2/2018	16/053156
Dell Products L.P.	Apparatus and Method for Diagnostic use of BIOS Attributes to Remediate Configuration Issues	8/2/2018	16/053426
Dell Products L.P.	METHOD TO DISINTEGRATE A MONOLITH SERVICE TO MICROSERVICES	8/3/2018	16/054285
Dell Products L.P.	Reducing Downtime When Applying a Patch to Multiple Databases	8/3/2018	16/054435
Dell Products L.P.	SYSTEMS AND METHODS FOR REDUCING TEMPERATURE CYCLING RISK ON AN INFORMATION HANDLING RESOURCE	8/3/2018	16/054131
Dell Products L.P.	SYSTEMS AND METHODS FOR COMBINED ACTIVE AND PASSIVE COOLING OF AN INFORMATION HANDLING RESOURCE	8/3/2018	16/054098
Dell Products L.P.	Method and Apparatus for Providing a Root of Trust using a Baseboard Management Controller	8/3/2018	16/054872

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Owner	Title	Date	Application No.
Dell Products L.P.	Apparatus and Method for Unified System Power Button Behavior Across Different Information Handling System Architectures	8/3/2018	16/054878
Dell Products L.P.	System and Method of Utilizing Information Handling Systems with Multiple Power Levels	8/3/2018	16/054491
Dell Products L.P.	Autonomous Creation of New Microservices and Modification of Existing Microservices	8/3/2018	16/054003
Dell Products L.P.	INTELLIGENT DUAL INLINE MEMORY MODULE THERMAL CONTROLS FOR MAXIMUM UPTIME	8/3/2018	16/054971
Dell Products L.P.	SYSTEM AND METHOD TO PROVIDE OPTIMAL POLLING OF DEVICES FOR REAL TIME DATA	8/3/2018	16/054489
Dell Products L.P.	Selective Blocking of Network Access for Third Party Applications Based on File Content	8/3/2018	16/054408
Dell Products L.P.	System and Method of Utilizing Information Handling Systems in a Chamber	8/3/2018	16/054403
Dell Products L.P.	Systems and Methods to Stage External Device Firmware for an External Device in an Information Handling System	8/3/2018	16/054756
EMC Corporation	EXECUTING STREAMING DATA WRITES WITHOUT DUPLICATION OR LOSS	5/9/2018	15/975136
EMC Corporation	METHOD AND DEVICE FOR MANAGING SESSIONS	6/4/2018	15/996625
EMC IP Holding Company LLC	STORAGE SYSTEM WITH DATA DURABILITY SIGNALING FOR DIRECTLY-ADDRESSABLE STORAGE DEVICES	5/9/2018	15/975254
EMC IP Holding Company LLC	ORGANIZING PRESENT AND FUTURE READS FROM A TIERED STREAMING DATA STORAGE LAYER	5/9/2018	15/974963
EMC IP Holding Company LLC	EFFICIENTLY EXECUTING CONCURRENT OPERATIONS THAT DEPEND ON EACH OTHER IN A STREAMING DATA ENVIRONMENT	5/9/2018	15/974922
EMC IP Holding Company LLC	DE-MULTIPLEXING STREAMING DATA FROM A FAST WRITE AHEAD DURABLE LOG INTO SEGMENTS	5/9/2018	15/974906
EMC IP Holding Company LLC	DYNAMICALLY SCALING A NUMBER OF STREAM SEGMENTS THAT DYNAMICALLY STORE STREAMING DATA WHILE PRESERVING THE ORDER OF WRITES	5/9/2018	15/975499
EMC IP Holding Company LLC	ATOMICALLY COMMITTING RELATED STREAMING DATA ACROSS MULTIPLE DISTRIBUTED RESOURCES	5/9/2018	15/975433

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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	CONCURRENT READ-WRITE ACCESS TO A STREAM BY A SET OF CLIENTS USING A STATE SYNCHRONIZER	5/9/2018	15/975411
EMC IP Holding Company LLC	ENCODING AND TRANSMITTING STREAM DATA WITHOUT PRIOR KNOWLEDGE OF DATA SIZE	5/9/2018	15/975165
EMC IP Holding Company LLC	DEDUPLICATION AND COMPRESSION OF DATA SEGMENTS IN A DATA STORAGE SYSTEM	5/10/2018	15/976371
EMC IP Holding Company LLC	CLUSTER FILE SYSTEM COMPRISING DATA MOVER MODULES HAVING ASSOCIATED QUOTA MANAGER FOR MANAGING BACK-END USER QUOTAS	5/11/2018	15/977548
EMC IP Holding Company LLC	PATH NAME CACHE FOR NOTIFICATIONS OF FILE CHANGES	5/11/2018	15/977575
EMC IP Holding Company LLC	MECHANISM FOR TRANSPARENT VIRTUAL TAPE ENGINES RESTART	5/16/2018	15/981170
EMC IP Holding Company LLC	ANALYSIS OF SMART METER DATA BASED ON FREQUENCY CONTENT	5/18/2018	15/983294
EMC IP Holding Company LLC	SEAMLESS MIGRATION OF STORAGE VOLUMES BETWEEN STORAGE ARRAYS	5/23/2018	15/987459
EMC IP Holding Company LLC	METHOD AND APPROACH FOR PAGINATION OVER DATA STREAM WITH SLIDING WINDOW	5/25/2018	15/990326
EMC IP Holding Company LLC	GROUP-BASED CONTAINER CHECKPOINT GENERATION	5/29/2018	15/991669
EMC IP Holding Company LLC	PROCESSING DEVICE CONFIGURED FOR EFFICIENT GENERATION OF COMPRESSION ESTIMATES FOR DATASETS	5/29/2018	15/991380
EMC IP Holding Company LLC	PROCESSING DEVICE CONFIGURED FOR EFFICIENT GENERATION OF DATA REDUCTION ESTIMATES FOR COMBINATIONS OF DATASETS	5/29/2018	15/991363
EMC IP Holding Company LLC	PROCESSING DEVICE UTILIZING POLYNOMIAL-BASED SIGNATURE SUBSPACE FOR EFFICIENT GENERATION OF DEDUPLICATION ESTIMATE	5/29/2018	15/991054
EMC IP Holding Company LLC	CONTENT-BASED SIGNATURE PREFIX FOR EFFICIENT GENERATION OF DEDUPLICATION ESTIMATE	5/29/2018	15/991035
EMC IP Holding Company LLC	STORAGE SYSTEM CONFIGURED FOR EFFICIENT GENERATION OF CAPACITY RELEASE ESTIMATES FOR DELETION OF DATASETS	5/29/2018	15/991018

[Schedule to Patent Security Agreement]

PATENT
REEL: 060160 FRAME: 0893

Owner	Title	Date	Application No.
EMC IP Holding Company LLC	IMPLEMENTING SNAPSHOT SETS FOR CONSISTENCY GROUPS OF STORAGE VOLUMES	5/29/2018	15/991262
EMC IP Holding Company LLC	PARALLEL PROCESSING DATABASE SYSTEM WITH A SHARED METADATA STORE	5/30/2018	15/993405
EMC IP Holding Company LLC	EMBEDDED OBJECT DATA STORAGE DETERMINED BY OBJECT SIZE INFORMATION	5/30/2018	15/992784
EMC IP Holding Company LLC	DATA PROTECTION AND LONG TERM RETENTION	5/30/2018	15/992261
EMC IP Holding Company LLC	PROCESS-BASED LOAD BALANCING AND FAILOVER POLICY IMPLEMENTATION IN STORAGE MULTI-PATH LAYER OF HOST DEVICE	5/31/2018	15/993703
EMC IP Holding Company LLC	AVAILABILITY-DRIVEN DATA RECOVERY IN CLOUD STORAGE SYSTEMS	5/31/2018	15/995060
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR BACKING UP AND RESTORING DATA	6/4/2018	15/996568
EMC IP Holding Company LLC	CUMULATIVE BACKUPS	6/6/2018	16/001738
EMC IP Holding Company LLC	USING SERVER SIDE FONT PREPARATION TO ACHIEVE WYSIWYG AND CROSS PLATFORM FIDELITY ON WEB BASED WORD PROCESSOR	6/7/2018	16/002474
EMC IP Holding Company LLC	DECOUPLED BACKUP SOLUTION FOR DISTRIBUTED DATABASES ACROSS A FAILOVER CLUSTER	6/8/2018	16/003966
EMC IP Holding Company LLC	Advanced Multi Backup Recovery	6/13/2018	16/007948
EMC IP Holding Company LLC	INTRA-CLUSTER MIGRATION FOR ELASTIC CLOUD STORAGE DEVICES	6/13/2018	16/007419
EMC IP Holding Company LLC	FLOATING DATA PROTECTION	6/13/2018	16/007250
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR NEGATIVE FEEDBACK CACHE DATA FLUSH IN PRIMARY STORAGE SYSTEMS	6/13/2018	16/007240
EMC IP Holding Company LLC	DISASTER RECOVERY WITH CONSOLIDATED ERASURE CODING IN GEOGRAPHICALLY DISTRIBUTED SETUPS	6/15/2018	16/010322
EMC IP Holding Company LLC	Deleting Data in a Geographically Diverse Storage Construct	6/15/2018	16/010255
EMC IP Holding Company LLC	Data Convolution for Geographically Diverse Storage	6/15/2018	16/010246
EMC IP Holding Company LLC	DATA LIFETIME-AWARE MIGRATION	6/15/2018	16/010228

[Schedule to Patent Security Agreement]

Owner	Title	Date	Application No.
EMC IP Holding Company LLC	PROCESSING DEVICE CONFIGURED FOR DATA INTEGRITY TESTING UTILIZING REPLICATED TEST METADATA FILE	6/20/2018	16/012931
EMC IP Holding Company LLC	CONTENT ADDRESSABLE STORAGE SYSTEM CONFIGURED FOR EFFICIENT STORAGE OF COUNT-KEY-DATA TRACKS	6/20/2018	16/013024
EMC IP Holding Company LLC	CLUSTERED STORAGE SYSTEM WITH STATELESS INTER-MODULE COMMUNICATION FOR PROCESSING OF COUNT-KEY-DATA TRACKS	6/20/2018	16/012990
EMC IP Holding Company LLC	PROCESSING DEVICE CONFIGURED FOR DATA INTEGRITY TESTING UTILIZING SIGNATURE-BASED MULTI-PHASE WRITE OPERATIONS	6/20/2018	16/012902
EMC IP Holding Company LLC	PROVIDING SERVICES IN A DATA STORAGE SYSTEM	6/21/2018	16/013989
EMC IP Holding Company LLC	RSA Trusted networks: RSA packet frames for advanced networking switches	6/21/2018	16/014984
EMC IP Holding Company LLC	ADAPTIVE THRESHOLDS FOR CONTAINERS	6/22/2018	16/016103
EMC IP Holding Company LLC	MULTI-LEVEL DATA DEDUPLICATION FOR ELASTIC CLOUD STORAGE DEVICES	6/22/2018	16/016096
EMC IP Holding Company LLC	MANAGING DATA WITHIN SOLID STATE DRIVE STORAGE BASED ON RECURRING WRITE QUOTAS	6/27/2018	16/066504
EMC IP Holding Company LLC	MAINTAINING A SINGLE COPY OF DATA WITHIN A READ CACHE	6/27/2018	16/066498
EMC IP Holding Company LLC	GENERATING A LARGE, NON- COMPRESSIBLE DATA STREAM	6/28/2018	16/022501
EMC IP Holding Company LLC	AUTOMATED INTERNET OF THINGS BASED SOFTWARE PATCHING	6/28/2018	16/021310
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR BACKUP STORAGE GARBAGE COLLECTION	6/28/2018	16/022622
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR BACKUP TOPOLOGY MAP	6/28/2018	16/022604
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR ADAPTIVE BACKUP WORKFLOWS IN DYNAMIC PRIORITY ENVIRONMENT	6/28/2018	16/022585
EMC IP Holding Company LLC	METHOD AND DEVICE FOR MANAGING STORAGE SYSTEM	6/28/2018	16/021218
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR PREDICTIVE LOADING OFSOFTWARE RESOURCES	6/29/2018	16/024000
EMC IP Holding Company LLC	Anomaly Detection in Time-Series Data Using State Inference and Machine Learning	6/29/2018	16/023110

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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	Workflow Simulation Using Provenance Data Similarity and Sequence Alignment	6/29/2018	16/023116
EMC IP Holding Company LLC	Data Management of connected cars cameras for homeland security and smart cities	6/29/2018	16/024295
EMC IP Holding Company LLC	Redefining Backup SLOs for effective restore	6/29/2018	16/024278
EMC IP Holding Company LLC	Non-Centralized Data Synchronization for IoT and other Distributed Applications	6/29/2018	16/024254
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR COMBINING ERASURE-CODED PROTECTION SETS	6/29/2018	16/024314
EMC IP Holding Company LLC	Block based striped backups	6/29/2018	16/024277
EMC IP Holding Company LLC	Real-Time Viewing Tool for Compressed Log Data	6/29/2018	16/023113
EMC IP Holding Company LLC	Detection of Malfunctioning Sensors in a Multi-Sensor Internet of Things Environment	6/30/2018	16/024759
EMC IP Holding Company LLC	Data Reduction Techniques for a Multi- Sensor Internet of Things Environment	6/30/2018	16/024757
EMC IP Holding Company LLC	INTELLIGENT SERVICE DISTRIBUTOR AND CONTROLLER WITH REAL TIME SERVICE CALIBRATION	7/3/2018	16/026608
EMC IP Holding Company LLC	SERVER SELECTION FOR OPTIMIZED MALWARE SCAN ON NAS	7/3/2018	16/026906
EMC IP Holding Company LLC	METHODS AND SYSTEMS FOR SERVERLESS DATA DEDUPLICATION	7/5/2018	16/028324
EMC IP Holding Company LLC	APPLICATION DISTRIBUTED OPTIMAL BACKUP MODEL	7/6/2018	16/028685
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR ORCHESTRATED APPLICATION PROTECTION	7/6/2018	16/028711
EMC IP Holding Company LLC	INSTANT RESTORE AND INSTANT ACCESS OF HYPER-V VMS AND APPLICATIONS RUNNING INSIDE VMS USING DATA DOMAIN BOOSTFS	7/6/2018	16/028729
EMC IP Holding Company LLC	Simultaneous File Level Recovery from multiple backups using Proxy virtual machine	7/6/2018	16/029368
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR CRITICAL VIRTUAL MACHINE PROTECTION	7/6/2018	16/028679
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR EFFICIENT RESTORE	7/6/2018	16/028693
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR FAULT TOLERANT BACKUP GENERATION IN A VIRTUAL ENVIRONMENT	7/6/2018	16/028672

[Schedule to Patent Security Agreement]

PATENT
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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR RESILIENT BACKUP GENERATION	7/6/2018	16/028670
EMC IP Holding Company LLC	DISTRIBUTED FILE SYSTEMS ON CONTENT DELIVERY NETWORKS	7/10/2018	16031775
EMC IP Holding Company LLC	DATA MANAGEMENT IN AN ELASTIC CLOUD STORAGE ENVIRONMENT	7/10/2018	16/030976
EMC IP Holding Company LLC	DATACENTER PREEMPTIVE MEASURES FOR IMPROVING PROTECTION USING IOT SENSORS	7/10/2018	16031936
EMC IP Holding Company LLC	EVENTUAL CONSISTENCY IN A DEDUPLICATED CLOUD STORAGE SYSTEM	7/10/2018	16031920
EMC IP Holding Company LLC	METHOD FOR MAXIMUM DATA REDUCTION COMBINING COMPRESSION WITH DEDUPLICATION IN STORAGE ARRAYS	7/10/2018	16031910
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR ORCHESTRATED BACKUP IN A VIRTUALIZED ENVIRONMENT	7/10/2018	16/031261
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR DYNAMIC CONFIGURATION OF BACKUP AGENTS	7/10/2018	16/031236
EMC IP Holding Company LLC	GENERATIONAL GARBAGE COLLECTOR	7/11/2018	16/032287
EMC IP Holding Company LLC	DYNAMIC MODIFICATION OF INFORMATION PRESENTATION AND LINKAGE BASED ON USAGE PATTERNS AND SENTIMENTS	7/11/2018	16/032358
EMC IP Holding Company LLC	client-side caching for deduplication data protection and storage systems	7/11/2018	16/033124
EMC IP Holding Company LLC	EMBEDDED DIAGNOSTIC TOOL FOR PREDICTION OF PROBLEMS RELATING TO NETWORK BANDWIDTH	7/11/2018	16032930
EMC IP Holding Company LLC	A combined read/write cache for a deduplicated metadata service	7/11/2018	16/033058
EMC IP Holding Company LLC	Accelerating write performance for microservices utilizing a Write-Ahead Log (WAL)	7/11/2018	16/033019
EMC IP Holding Company LLC	A scalable, persistent, high performance, and crash resilient metadata microservice	7/11/2018	16/032960
EMC IP Holding Company LLC	An architecture for scalable metadata microservices orchestration	7/11/2018	16/032898
EMC IP Holding Company LLC	SHUFFLING FILE DIGESTS STORED IN DATA STORES OF A DISTRIBUTED FILE SYSTEM	7/12/2018	16/033603
EMC IP Holding Company LLC	DECENTRALIZED DATA MANAGEMENT VIA GEOGRAPHIC LOCATION-BASED CONSENSUS PROTOCOL	7/12/2018	16/033339
EMC IP Holding Company LLC	Real Time DellEMC Server Hardware Digital Manual using Artificial Intelligence	7/12/2018	16/033804

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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	Physical file system consistency checking - PFSCK	7/12/2018	16/034282
EMC IP Holding Company LLC	Network configuration method to allow access to the backup and restores to mtrees on a clustered backup appliance	7/12/2018	16/034218
EMC IP Holding Company LLC	DISK SYNCHRONIZATION	7/13/2018	16/034510
EMC IP Holding Company LLC	Automation and optimisation of data recovery after a ransomware attack	7/13/2018	16035270
EMC IP Holding Company LLC	HOST DEVICE WITH MULTI-PATH LAYER CONFIGURED TO PROVIDE CLUSTER IDENTIFICATION INFORMATION TO STORAGE SYSTEM	7/13/2018	16/034625
EMC IP Holding Company LLC	HOST DEVICE WITH MULTI-PATH LAYER CONFIGURED FOR PER-PROCESS DATA REDUCTION CONTROL	7/13/2018	16/034603
EMC IP Holding Company LLC	Internet of Things Gateways of Moving Networks	7/13/2018	16/034427
EMC IP Holding Company LLC	Resource Allocation and Provisioning in a Multi-Tier Edge-Cloud Virtualization Environment	7/13/2018	16/034432
EMC IP Holding Company LLC	AUTOMATICALLY SETTING A DYNAMIC BACKUP POLICY IN A CLOUD ENVIRONMENT	7/13/2018	16035246
EMC IP Holding Company LLC	DECENTRALIZED AND DISTRIBUTED CONTINUOUS REPLICATION SYSTEM FOR MOVING DEVICES	7/13/2018	16035235
EMC IP Holding Company LLC	BACKUP AND TIERED POLICY COORDINATION IN TIME SERIES DATABASES	7/13/2018	16035221
EMC IP Holding Company LLC	Automation and optimisation of data recovery after a ransomware attack	7/13/2018	16035200
EMC IP Holding Company LLC	ENHANCED DATA STORAGE USING COMPRESSED DATA	7/13/2018	16035185
EMC IP Holding Company LLC	CACHE MANAGEMENT SYSTEM AND METHOD	7/13/2018	16/034657
EMC IP Holding Company LLC	HOST DEVICE WITH MULTI-PATH LAYER CONFIGURED FOR DETECTION AND REPORTING OF PATH PERFORMANCE ISSUES	7/16/2018	16/035785
EMC IP Holding Company LLC	STORAGE SYSTEM WITH REPLICATION PROCESS UTILIZING SIMULATED TARGET RESPONSES	7/16/2018	16/036195
EMC IP Holding Company LLC	TECHNIQUES FOR ASSESSING DATA REDUCTION EFFICIENCY	7/16/2018	16035867
EMC IP Holding Company LLC	Systems and Methods for Snapshot-Less Backups	7/16/2018	16/036893

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[Schedule to Patent Security Agreement]

Owner	Title	Date	Application No.
EMC IP Holding Company LLC	STORAGE SYSTEM WITH MULTIPLE WRITE JOURNALS SUPPORTING SYNCHRONOUS REPLICATION FAILURE RECOVERY	7/17/2018	16/037050
EMC IP Holding Company LLC	METHODS, SYSTEMS, AND COMPUTER READABLE MEDIUMS FOR PERFORMING A FREE-FORM QUERY	7/18/2018	16/038408
EMC IP Holding Company LLC	OBJECT HEADERS FACILITATING STORAGE OF DATA IN A WRITE BUFFER OF A STORAGE SYSTEM	7/18/2018	16/038612
EMC IP Holding Company LLC	Detection of Resource Bottlenecks in Execution of Workflow Tasks Using Provenance Data	7/18/2018	16/038373
EMC IP Holding Company LLC	System Operational Analytics Using Additional Features for Health Score Computation	7/18/2018	16/038370
EMC IP Holding Company LLC	DATA DISTRIBUTION MANAGEMENT IN MOBILE NETWORK	7/18/2018	16/038325
EMC IP Holding Company LLC	DECENTRALIZED AND DISTRIBUTED CONTINUOUS REPLICATION SYSTEM FOR MOVING DEVICES	7/13/2018	16035235
EMC IP Holding Company LLC	BACKUP AND TIERED POLICY COORDINATION IN TIME SERIES DATABASES	7/13/2018	16035221
EMC IP Holding Company LLC	Automation and optimisation of data recovery after a ransomware attack	7/13/2018	16035200
EMC IP Holding Company LLC	ENHANCED DATA STORAGE USING COMPRESSED DATA	7/13/2018	16035185
EMC IP Holding Company LLC	CACHE MANAGEMENT SYSTEM AND METHOD	7/13/2018	16/034657
EMC IP Holding Company LLC	HOST DEVICE WITH MULTI-PATH LAYER CONFIGURED FOR DETECTION AND REPORTING OF PATH PERFORMANCE ISSUES	7/16/2018	16/035785
EMC IP Holding Company LLC	STORAGE SYSTEM WITH REPLICATION PROCESS UTILIZING SIMULATED TARGET RESPONSES	7/16/2018	16/036195
EMC IP Holding Company LLC	TECHNIQUES FOR ASSESSING DATA REDUCTION EFFICIENCY	7/16/2018	16035867
EMC IP Holding Company LLC	Systems and Methods for Snapshot-Less Backups	7/16/2018	16/036893
EMC IP Holding Company LLC	STORAGE SYSTEM WITH MULTIPLE WRITE JOURNALS SUPPORTING SYNCHRONOUS REPLICATION FAILURE RECOVERY	7/17/2018	16/037050
EMC IP Holding Company LLC	METHODS, SYSTEMS, AND COMPUTER READABLE MEDIUMS FOR PERFORMING A FREE-FORM QUERY	7/18/2018	16/038408

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[Schedule to Patent Security Agreement]

Owner	Title	Date	Application No.
EMC IP Holding Company LLC	OBJECT HEADERS FACILITATING STORAGE OF DATA IN A WRITE BUFFER OF A STORAGE SYSTEM	7/18/2018	16/038612
EMC IP Holding Company LLC	Detection of Resource Bottlenecks in Execution of Workflow Tasks Using Provenance Data	7/18/2018	16/038373
EMC IP Holding Company LLC	System Operational Analytics Using Additional Features for Health Score Computation	7/18/2018	16/038370
EMC IP Holding Company LLC	DATA DISTRIBUTION MANAGEMENT IN MOBILE NETWORK	7/18/2018	16/038325
EMC IP Holding Company LLC	DISTRIBUTED MEMORY CHECKPOINTING USING STORAGE CLASS MEMORY SYSTEMS	7/18/2018	16/038717
EMC IP Holding Company LLC	SYNCHRONOUS REPLICATION IN A STORAGE SYSTEM	7/18/2018	16/038543
EMC IP Holding Company LLC	STORAGE MANAGEMENT SYSTEM AND METHOD	7/18/2018	16/038530
EMC IP Holding Company LLC	Dynamic Storage Service Advisory	7/18/2018	16/038428
EMC IP Holding Company LLC	Discovery System and Method	7/18/2018	16/038587
EMC IP Holding Company LLC	STORAGE SYSTEM WITH DECREMENT PROTECTION OF REFERENCE COUNTS	7/19/2018	16/040231
EMC IP Holding Company LLC	SYNCHRONIZATION OBJECT WITH WATERMARK	7/19/2018	16/039902
EMC IP Holding Company LLC	Tracing Mechanism for Monitoring and Analysis of Cloud-Based Communication Session Attacks	7/19/2018	16/039503
EMC IP Holding Company LLC	Allocation of Shared Computing Resources Using Source Code Feature Extraction and Clustering-Based Training of Machine Learning Models	7/19/2018	16/039743
EMC IP Holding Company LLC	EFFICIENT HEARTBEAT WITH REMOTE SERVERS BY NAS CLUSTER NODES	7/19/2018	16/039957
EMC IP Holding Company LLC	MANAGING CONTENT SEARCHES IN COMPUTING ENVIRONMENTS	7/19/2018	16/039407
EMC IP Holding Company LLC	DATA ACCESS DURING DATA RECOVERY	7/20/2018	16/041267
EMC IP Holding Company LLC	DIRECT ACCESS TO BACKUP COPY	7/20/2018	16/041303
EMC IP Holding Company LLC	METHOD AND MECHANISM FOR OPTIMAL SCOPE EVALUATION IN SCOPE BASED HIERARCHICAL CONFIGURATION USING EVALUATED SCOPE PROPAGATION TECHNIQUE	7/20/2018	16/040903

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[Schedule to Patent Security Agreement]

Owner	Title	Date	Application No.
EMC IP Holding Company LLC	Predicting Time-To-Finish of a Workflow Using Deep Neural Network with Biangular Activation Functions	7/20/2018	16/040771
EMC IP Holding Company LLC	IDENTIFICATION AND CURATION OF APPLICATION PROGRAMMING INTERFACE DATA FROM DIFFERENT SOURCES	7/20/2018	16/041353
EMC IP Holding Company LLC	Dataflow Execution Time Estimation for In-Memory Distributed Processing Framework	7/20/2018	16/040774
EMC IP Holding Company LLC	In-Memory Dataflow Execution with Dynamic Placement of Cache Operations	7/20/2018	16/040761
EMC IP Holding Company LLC	Super-Resolution Imaging for a Multi- Sensor Internet of Things Environment	7/20/2018	16/040775
EMC IP Holding Company LLC	CLUSTERED STORAGE SYSTEM CONFIGURED FOR BANDWIDTH EFFICIENT PROCESSING OF WRITES AT SIZES BELOW A NATIVE PAGE SIZE	7/23/2018	16/042544
EMC IP Holding Company LLC	STORAGE SYSTEM WITH MULTI- PHASE VERIFICATION OF SYNCHRONOUSLY REPLICATED DATA	7/23/2018	16/042503
EMC IP Holding Company LLC	METADATA LOADING IN STORAGE SYSTEMS	7/23/2018	16/042406
EMC IP Holding Company LLC	SMART AUTO-BACKUP OF VIRTUAL MACHINES USING A VIRTUAL PROXY	7/23/2018	16/042496
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR DYNAMIC DATA PROTECTION	7/23/2018	16/041995
EMC IP Holding Company LLC	EFFICIENT RESTORE OF SYNTHETIC FULL BACKUP BASED VIRTUAL MACHINES THAT INCLUDE USER CHECKPOINTS	7/23/2018	16/041967
EMC IP Holding Company LLC	Parallel data caching for Virtual Disk files backed up in media based on the Virtual Disk block allocation (BAT table).	7/23/2018	16/041975
EMC IP Holding Company LLC	METHOD TO SUPPORTSYNCHRONOUS REPLICATION FAILOVER	7/23/2018	16/042363
EMC IP Holding Company LLC	INTELLIGENT LOG GAP DETECTION TO PREVENT UNNECESSARY BACKUP PROMOTION	7/23/2018	16/041954
EMC IP Holding Company LLC	INTELLIGENT LOG GAP DETECTION TO ENSURE NECESSARY BACKUP PROMOTION	7/23/2018	16/041929
EMC IP Holding Company LLC	CLUSTERED STORAGE SYSTEM CONFIGURED WITH DECOUPLING OF PROCESS RESTART FROM IN-FLIGHT COMMAND EXECUTION	7/24/2018	16/043281
EMC IP Holding Company LLC	STORAGE SYSTEM WITH SNAPSHOT GENERATION CONTROL UTILIZING MONITORED DIFFERENTIALS OF RESPECTIVE STORAGE VOLUMES	7/24/2018	16/044016

[Schedule to Patent Security Agreement]

PATENT
REEL: 060160 FRAME: 0901

Owner	Title	Date	Application No.
EMC IP Holding Company LLC	IDENTIFYING VULNERABILITIES IN PROCESSING NODES	7/24/2018	16/044147
EMC IP Holding Company LLC	PREDICTIVE SCHEDULED ANTI- VIRUS SCANNING	7/24/2018	16/043261
EMC IP Holding Company LLC	PREDICTIVE REAL-TIME ANTI-VIRUS SCANNING	7/24/2018	16/043276
EMC IP Holding Company LLC	AUTOMATED DECISION ENGINE FOR SETTING I/O SERVICE LEVEL OBJECIVES FOR I/O TAGGING	7/24/2018	16043483
EMC IP Holding Company LLC	CONCURRENT DATA ENTROPY AND DIGEST COMPUTATION OPERATING ON SAME DATA FOR CPU CACHE EFFICIENCY	7/24/2018	16043640
EMC IP Holding Company LLC	PREDICTIVE REAL-TIME AND SCHEDULED ANTI-VIRUS SCANNING	7/24/2018	16/043333
EMC IP Holding Company LLC	DATA DEDUPLICATION FOR ELASTIC CLOUD STORAGE DEVICES	7/24/2018	16/043353
EMC IP Holding Company LLC	SYNCHRONIZATION OBJECT PRIORITIZATION SYSTEMS AND METHODS	7/24/2018	16/043426
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR AUTOMATED STORAGE PROVISIONING	7/25/2018	16/045050
EMC IP Holding Company LLC	PROCESSING DEVICE CONFIGURED FOR EFFICIENT GENERATION OF A DIRECT MAPPED HASH TABLE PERSISTED TO NON-VOLATILE BLOCK MEMORY	7/25/2018	16/044988
EMC IP Holding Company LLC	EFFICIENT PACKING OF COMPRESSED DATA IN STORAGE SYSTEM IMPLEMENTING DATA STRIPING	7/25/2018	16/044957
EMC IP Holding Company LLC	Automatic bug reproduction using replication and CPU lockstep	7/25/2018	16/044829
EMC IP Holding Company LLC	PERFORMANCE MONITORING AND ENHANCEMENT	7/25/2018	16/044917
EMC IP Holding Company LLC	An Innovative Airflow Leaking-proof self- sealing NVME drive carrier design	7/25/2018	16/044674
EMC IP Holding Company LLC	A new thermal management system of lithium-ion battery products	7/25/2018	16/044708
EMC IP Holding Company LLC	HOST-DEFINED I/O STORAGE CONTROL BASED ON APPLICATION INSTANCE AND/OR CONTROL GROUP	7/26/2018	16045889
EMC IP Holding Company LLC	CLOUD ACCESS THROUGH TAPE TRANSFORMATION	7/26/2018	16045878
EMC IP Holding Company LLC	INDIRECT STORAGE DATA TRANSFER	7/26/2018	16045860

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PATENT
REEL: 060160 FRAME: 0902

Owner	Title	Date	Application No.
EMC IP Holding Company LLC	SHARING OF CONTEXT AMONG BASE STATION NODES FOR MOBILITY MANAGEMENT IN MOBILE COMMUNICATIONS NETWORK	7/26/2018	16/046260
EMC IP Holding Company LLC	DETECTING SERVER PAGES WITHIN BACKUPS	7/26/2018	16046212
EMC IP Holding Company LLC	System & Methods to Understand Customer Intent and Recommendation	7/26/2018	16/046402
EMC IP Holding Company LLC	METHOD AND APPARATUS FOR DYNAMIC FLOW CONTROL IN DISTRIBUTED STORAGE SYSTEMS	7/27/2018	16/047087
EMC IP Holding Company LLC	SNAPSHOT LOCKING MECHANISM	7/27/2018	16/047815
EMC IP Holding Company LLC	SYNCHRONIZATION OF METADATA- BASED SYSTEM SNAPSHOTS WITH A STATE OF USER DATA	7/27/2018	16/047639
EMC IP Holding Company LLC	AD-HOC COMPUTATION SYSTEM FORMED IN MOBILE NETWORK	7/27/2018	16/047718
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR GUIDED SYSTEM RESTORATION	7/27/2018	16/047791
EMC IP Holding Company LLC	DYNAMIC REPRIORITIZATION OF CONTENT DOWNLOAD DURING SYNCHRONIZATION	7/30/2018	16/048683
EMC IP Holding Company LLC	PROVIDING DATA PROTECTION TO DESTINATION STORAGE OBJECTS ON REMOTE ARRAYS IN RESPONSE TO ASSIGNMENT OF DATA PROTECTION TO CORRESPONDING SOURCE STORAGE OBJECTS ON LOCAL ARRAYS	7/30/2018	16/048486
EMC IP Holding Company LLC	System and Methods for Visual Recommendations	7/30/2018	16/048787
EMC IP Holding Company LLC	METHOD AND APPARATUS FOR TRACE DATA COLLECTION	7/30/2018	16/049098
EMC IP Holding Company LLC	TECHNIQUES FOR MULTIPLE DIRECTORS CONCURRENTLY SERVICING I/Os DIRECTED TO SAME PHYSICAL STORAGE DEVICES	7/30/2018	16048637
EMC IP Holding Company LLC	AUTOMATED MANAGEMENT OF WRITE STREAMS FOR MULTI-TENANT STORAGE	7/30/2018	16048724
EMC IP Holding Company LLC	METHOD FOR PERFORMANCE ANALYSIS IN A CONTINUOUS INTEGRATION PIPELINE	7/30/2018	16/048698
EMC IP Holding Company LLC	DUAL LAYER DEDUPLICATION FOR A FILE SYSTEM RUNNING OVER A DEDUPLICATED BLOCK STORAGE	7/30/2018	16/048763
EMC IP Holding Company LLC	CREATING IDENTICAL SNAP PAIRS DURING SYNC REPLICATION WITH NO PERFORMANCE IMPACT	7/30/2018	16/048767

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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	EFFICIENT COMPUTATION OF PARITY DATA IN STORAGE SYSTEM IMPLEMENTING DATA STRIPING	7/30/2018	16/049185
EMC IP Holding Company LLC	MULTI-TENANT DEDUPLICATION WITH NON-TRUSTED STORAGE SYSTEM	7/30/2018	16/048980
EMC IP Holding Company LLC	DECENTRALIZED POLICY PUBLISH AND QUERY SYSTEM FOR MULTI- CLOUD COMPUTING ENVIRONMENT	7/30/2018	16/048785
EMC IP Holding Company LLC	Seamless mobility for kubernetes based stateful pods using moving target defense	7/30/2018	16/049493
EMC IP Holding Company LLC	Network block device based continuous replication for kubernetes container management systems	7/30/2018	16/049564
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR CREATING VIRTUAL SNAPSHOTS USING INPUT/OUTPUT (I/O) INTERCEPTION	7/30/2018	16/049556
EMC IP Holding Company LLC	UTILIZING GROUPS OF DATA PROTECTION POLICIES THAT ARE ASSIGNABLE TO STORAGE OBJECTS	7/30/2018	16/048489
EMC IP Holding Company LLC	UNIFIED APPROACH TO IMPORT, REPLICATION, AND MIGRATION OF STORAGE VOLUMES	7/30/2018	16049148
EMC IP Holding Company LLC	TECHNIQUES FOR LIMITING THE MAXIMUM STORAGE CONSUMED BY A FILE SYSTEM WITHOUT SHRINKING AN UNDERLYING VOLUME	7/30/2018	16/048944
EMC IP Holding Company LLC	MULTI-LEVEL TIME DECAY STORAGE QUEUE SERVICING I/Os DIRECTED TO SAME PHYSICAL STORAGE DEVICES	7/30/2018	16049064
EMC IP Holding Company LLC	A FLASH INTERFACE FOR PROCESSING DATASETS	7/31/2018	16049891
EMC IP Holding Company LLC	EMPLOYING MULTIPLE QUEUEING STRUCTURES WITHIN A USERSPACE STORAGE DRIVER TO INCREASE SPEED	7/31/2018	16/050591
EMC IP Holding Company LLC	Correction of Sensor Data in a Multi- Sensor Internet of Things Environment	7/31/2018	16/050239
EMC IP Holding Company LLC	Allocation of Shared Computing Resources Using a Classifier Chain	7/31/2018	16/049986
EMC IP Holding Company LLC	Enterprise Storage of Customer Transaction Data Using a Blockchain	7/31/2018	16/050231
EMC IP Holding Company LLC	HASH FUNCTION WITH CONTENT BASED SALT	7/31/2018	16/050173

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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	CACHE RECOVERY METHOD IN A DISTRIBUTED STORAGE SYSTEM	7/31/2018	16/050075
EMC IP Holding Company LLC	DYNAMIC PHYSICAL CAPACITY ALLOCATION IN AN UNBALANCED CAS SYSTEM	7/31/2018	16/050836
EMC IP Holding Company LLC	Managing Journaling Resources with Copies Stored in Multiple Locations	7/31/2018	16/051194
EMC IP Holding Company LLC	Anomaly-Based Ransomware Detection for Encrypted Files	7/31/2018	16/050581
EMC IP Holding Company LLC	OFFLOAD PROCESSING USING STORAGE DEVICE SLOTS	7/31/2018	16050868
EMC IP Holding Company LLC	Oracle Backup Discovery Algorithm for a centralized backup system	7/31/2018	16/051294
EMC IP Holding Company LLC	PERFORMANCE OPTIMIZATION FOR DATA PERSISTENCY IN ASYNCHRONOUS REPLICATION SETUPS	7/31/2018	16/050247
EMC IP Holding Company LLC	PERFORMANCE IMPROVEMENT FOR AN ACTIVE-ACTIVE DISTRIBUTED NON-ALUA SYSTEM WITH ADDRESS OWNERSHIPS	7/31/2018	16/050400
EMC IP Holding Company LLC	HOST BASED READ CACHE FOR SAN SUPPORTING NVMEF WITH E2E VALIDATION	7/31/2018	16/050474
EMC IP Holding Company LLC	Polling Process for Monitoring Interdependent Hardware Components	7/31/2018	16/050818
EMC IP Holding Company LLC	MAINTAINING LOGICAL TO PHYSICAL ADDRESS MAPPING DURING IN PLACE SECTOR REBUILD	7/31/2018	16/050530
EMC IP Holding Company LLC	Storage System with Decoupling of Reference Count Updates	7/31/2018	16/050926
EMC IP Holding Company LLC	STORAGE SYSTEM WITH SNAPSHOT- BASED DETECTION AND REMEDIATION OF RANSOMWARE ATTACKS	7/31/2018	16/050167
EMC IP Holding Company LLC	STORAGE SYSTEM WITH BACKUP CONTROL UTILIZING CONTENT-BASED SIGNATURES	7/31/2018	16/050051
EMC IP Holding Company LLC	STORAGE SYSTEM WITH SNAPSHOT GENERATION AND/OR PRESERVATION CONTROL RESPONSIVE TO MONITORED REPLICATION DATA	7/31/2018	16/049955
EMC IP Holding Company LLC	client data driven smart backup scheduler	7/31/2018	16/050324
EMC IP Holding Company LLC	DATA ENCRYPTION AND DECRYPTION TECHNIQUES	7/31/2018	16050268
EMC IP Holding Company LLC	INTELLIGENT MONITORING AND DIAGNOSTICS FOR APPLICATION SUPPORT	7/31/2018	16/050364

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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	DISTRIBUTED FILE SYSTEM LOAD BALANCING BASED ON AVAILABLE NODE CAPACITY	8/1/2018	16/051777
EMC IP Holding Company LLC	MOVING FROM BACK-TO-BACK TOPOLOGY TO SWITCHED TOPOLOGY IN AN INFINIBAND NETWORK	8/1/2018	16/051907
EMC IP Holding Company LLC	MODULE MIRRORING DURING NON-DISRUPTIVE UPGRADE	8/1/2018	16/052090
EMC IP Holding Company LLC	FAST INPUT/OUTPUT IN A CONTENT-ADDRESSABLE STORAGE ARCHITECTURE WITH PAGED METADATA	8/1/2018	16/052037
EMC IP Holding Company LLC	MANAGING DATA REDUCTION IN STORAGE SYSTEMS USING MACHINE LEARNING	8/1/2018	16/051985
EMC IP Holding Company LLC	METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR MANAGING DATA STORAGE IN DATA STORAGE SYSTEMS	8/1/2018	16/051805
EMC IP Holding Company LLC	METHOD AND APPARATUS FOR DISAGGREGATED OVERLAYS VIA APPLICATION SERVICES PROFILES	8/2/2018	16/052910
EMC IP Holding Company LLC	DATA PROTECTION DECISION BASED ON DEVICE USAGE	8/2/2018	16053629
EMC IP Holding Company LLC	Storage System with Decoupling of Reference Count Updates	7/31/2018	16/050926
EMC IP Holding Company LLC	STORAGE SYSTEM WITH SNAPSHOT- BASED DETECTION AND REMEDIATION OF RANSOMWARE ATTACKS	7/31/2018	16/050167
EMC IP Holding Company LLC	STORAGE SYSTEM WITH BACKUP CONTROL UTILIZING CONTENT-BASED SIGNATURES	7/31/2018	16/050051
EMC IP Holding Company LLC	STORAGE SYSTEM WITH SNAPSHOT GENERATION AND/OR PRESERVATION CONTROL RESPONSIVE TO MONITORED REPLICATION DATA	7/31/2018	16/049955
EMC IP Holding Company LLC	client data driven smart backup scheduler	7/31/2018	16/050324
EMC IP Holding Company LLC	CRASH RECOVERY OF VRPA CLUSTER PROTECTION ENGINE	8/2/2018	16053646
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR COMPRESSION AWARE CHUNKING OF BACKUP STREAMS	8/2/2018	16053707
EMC IP Holding Company LLC	Mapped RAID wear balancing by moving slices between RAID groups created from RAID Extents with similar wear level	8/2/2018	16/052999

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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	MULTI-DIMENSIONAL EVENT MODEL GENERATION	8/3/2018	16/053942
EMC IP Holding Company LLC	IMMEDIATE REPLICATION FOR DEDICATED DATA BLOCKS	8/3/2018	16/053872
EMC IP Holding Company LLC	SYSTEMS AND METHODS FOR SYNTHESIZING FULLY HYDRATED CLOUD SNAPSHOTS	8/3/2018	16054018
EMC IP Holding Company LLC	CONTINUOUS REPLICATION AND GRANULAR APPLICATION LEVEL REPLICATION	8/3/2018	16053976
EMC IP Holding Company LLC	CONTINUOUS REPLICATION AND GRANULAR APPLICATION LEVEL REPLICATION	8/3/2018	16053953
EMC IP Holding Company LLC	METHOD, STORAGE SYSTEM AND COMPUTER PROGRAM PRODUCT FOR MANAGING DATA STORAGE	8/3/2018	16/054122
EMC IP Holding Company LLC	METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR MANAGING DATA STORAGE	8/3/2018	16/054301
EMC IP Holding Company LLC	MANAGING INLINE DATA DE- DUPLICATION IN STORAGE SYSTEMS	8/3/2018	16/054588
EMC IP Holding Company LLC	METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR MANAGING DATA STORAGE	8/3/2018	16/054216
EMC IP Holding Company LLC	MANAGING DEDUPLICATION CHARACTERISTICS IN A STORAGE SYSTEM	8/3/2018	16/054477
EMC IP Holding Company LLC and EMC Corporation	MANAGING DATA INCONSISTENCIES IN FILES OF FILE SYSTEMS	9/30/2016	15/281304
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR OFFSET MIRRORING IN A STORAGE SYSTEM	12/30/2016	15/395441
EMC IP Holding Company LLC	DATA TRANSFORMATION FOR OBJECT STORAGE	6/13/2017	15/620892
EMC IP Holding Company LLC	EFFICIENT MIGRATION TO DISTRIBUTED STORAGE	6/13/2017	15/620897
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR COMPRESSION AWARE CHUNKING OF BACKUP STREAMS	8/2/2018	16053707
EMC IP Holding Company LLC	Mapped RAID wear balancing by moving slices between RAID groups created from RAID Extents with similar wear level	8/2/2018	16/052999
EMC IP Holding Company LLC	MULTI-DIMENSIONAL EVENT MODEL GENERATION	8/3/2018	16/053942
EMC IP Holding Company LLC	IMMEDIATE REPLICATION FOR DEDICATED DATA BLOCKS	8/3/2018	16/053872

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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	SYSTEMS AND METHODS FOR SYNTHESIZING FULLY HYDRATED CLOUD SNAPSHOTS	8/3/2018	16054018
EMC IP Holding Company LLC	CONTINUOUS REPLICATION AND GRANULAR APPLICATION LEVEL REPLICATION	8/3/2018	16053976
EMC IP Holding Company LLC	CONTINUOUS REPLICATION AND GRANULAR APPLICATION LEVEL REPLICATION	8/3/2018	16053953
EMC IP Holding Company LLC	METHOD, STORAGE SYSTEM AND COMPUTER PROGRAM PRODUCT FOR MANAGING DATA STORAGE	8/3/2018	16/054122
EMC IP Holding Company LLC	METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR MANAGING DATA STORAGE	8/3/2018	16/054301
EMC IP Holding Company LLC	GARBAGE COLLECTION FOR CHUNK-BASED STORAGE SYSTEMS	6/13/2017	15/620898
EMC IP Holding Company LLC	DATA SET VERIFICATION	6/13/2017	15/620900
EMC IP Holding Company LLC	STORAGE TIERING WITH EFFICIENT ALLOCATION OF REDUNDANT DATA	6/23/2017	15/631572
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR XOR CHAIN	6/28/2017	15/636435
EMC IP Holding Company LLC	CONTENT-AWARE DATA RECOVERY METHOD FOR ELASTIC CLOUD STORAGE	6/28/2017	15/636454
EMC IP Holding Company LLC	Fast GEO Recovery Method for Elastic Cloud Storage	6/28/2017	15/636470
EMC IP Holding Company LLC	GENERATIONAL GARBAGE COLLECTOR FOR TREES UNDER MULTI-VERSION CONCURRENCY CONTROL	6/29/2017	15/637080
EMC IP Holding Company LLC	SYSTEM AND METHOD FOR PARALLEL STORAGE TRANSFORMATION	6/29/2017	15/638330
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR TREE MANAGEMENT OF TREES UNDER MULTI-VERSION CONCURRENCY CONTROL	6/30/2017	15/639589
EMC IP Holding Company LLC	VIRTUAL PRIVATE CLOUD THAT PROVIDES ENTERPRISE GRADE FUNCTIONALITY AND COMPLIANCE	1/26/2018	15/881028
EMC IP Holding Company LLC	DATA REPLICATION OPTIMIZATION FOR ONLINE SOCIAL NETWORK CLOUD COMPUTING	7/31/2018	10037386
EMC IP Holding Company LLC	TECHNIQUES FOR CONVERGING METRICS FOR FILE- AND BLOCK-BASED VVOLS	7/31/2018	10037156
EMC IP Holding Company LLC	BOOT BLOCKING OF VIRTUAL STORAGE APPLIANCE	7/31/2018	10037427

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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR PREDICTIVE LOADING OF SOFTWARE RESOURCES	7/31/2018	10038761
EMC IP Holding Company LLC	DATA STORAGE SYSTEMS WITH EFFICIENT PROCESSING OF SINGLE MAPPING CALLBACK FOR HOST I/O REQUESTS	7/31/2018	10037289
EMC Corporation	METHOD AND SYSTEM FOR TIERING DATA	7/24/2018	10031675
EMC IP Holding Company LLC	MESSAGE GENERATION SYSTEM AND METHOD	7/24/2018	10,031,794
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR DATABASE PARTITIONING	7/24/2018	10031962
EMC Corporation	EXTENT-BASED TIERING FOR VIRTUAL STORAGE USING FULL LUNS	7/24/2018	10031703
EMC IP Holding Company LLC	TECHNIQUE FOR COPYING UNALLOCATED LOGICAL REGIONS OF THIN LOGICAL UNITS	7/17/2018	10025510
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR VIRTUAL STORAGE ARRAY MOBILITY AND LIVE MIGRATION USING LOCATOR-IDENTIFIER SEPARATION PROTOCOL	7/17/2018	10027546
EMC IP Holding Company LLC	TECHNIQUES FOR STORAGE VIRTUALIZATION	7/17/2018	10025523
EMC IP Holding Company LLC	EVENTUALLY CONSISTENT SYNCHRONOUS DATA REPLICATION IN A STORAGE SYSTEM	7/10/2018	10019194
EMC IP Holding Company LLC	VIRTUALIZED TARGET CHANNEL ADAPTER	7/10/2018	10019401
EMC IP Holding Company LLC	ASYNCHRONOUS DOMAIN NAME SERVER RESOLUTION WITH AUTOMATED CLASSIFICATION OF DOMAIN TYPE	7/3/2018	10,015,180
EMC IP Holding Company LLC	EARLY COMPRESSION PREDICTION IN A STORAGE SYSTEM WITH GRANULAR BLOCK SIZES	7/3/2018	10013200
EMC IP Holding Company LLC	SECURING DATA USING PER TENANT ENCRYPTION KEYS	7/3/2018	10013364
EMC IP Holding Company LLC	AUTHENTICATION USING METADATA FROM POSTS MADE TO SOCIAL NETWORKING WEBSITES	7/3/2018	10,015,171
EMC IP Holding Company LLC	METHODS AND APPARATUS FOR ANALYTICAL PROCESSING OF PROVENANCE DATA FOR HPC WORKFLOW OPTIMIZATION	7/3/2018	10,013,656
EMC IP Holding Company LLC	METHODS AND APPARATUS FOR MONITORING AND AUDITING NODES USING METADATA GATHERED BY AN IN-MEMORY PROCESS	7/3/2018	10,015,063

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Owner	Title	Date	Application No.
EMC IP Holding Company LLC	SPACE-EFFICIENT PERSISTENT BLOCK RESERVATION OPTIMIZED FOR COMPRESSION	7/3/2018	10,013,425
EMC IP Holding Company LLC	TRACKING COPY SESSIONS	6/26/2018	10007466
EMC IP Holding Company LLC	AUTOMATED CONFIGURATION OF HOST CONNECTIVITY	6/26/2018	10007455
EMC IP Holding Company LLC	HOST TO DEVICE I/O FLOW	6/26/2018	10007443
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR ADAPTIVE DATA MIGRATION IN SOLID STATE MEMORY	6/26/2018	10007462
EMC IP Holding Company LLC	PROACTIVE RELEASE OF HIGH PERFORMANCE DATA STORAGE RESOURCES WHEN EXCEEDING A SERVICE LEVEL OBJECTIVE	6/26/2018	10007434
EMC IP Holding Company LLC	EVENT BASED VALIDATION	6/26/2018	10007493
EMC IP Holding Company LLC	DATA STORAGE SYSTEM EMPLOYING SPACE RECLAIM APPROXIMATION	6/26/2018	10007671
EMC IP Holding Company LLC	VIRTUAL TIERING	6/26/2018	10007559
EMC IP Holding Company LLC	MALWARE DETECTION AND DATA PROTECTION INTEGRATION	6/26/2018	10009360
EMC IP Holding Company LLC	METHOD AND SYSTEM FOR GARBAGE COLLECTION IN A STORAGE SYSTEM BASED ON LONGEVITY OF STORED DATA	6/19/2018	10001946
EMC IP Holding Company LLC	INTEGRATED WIRELESS SENSOR NETWORK (WSN) AND MASSIVELY PARALLEL PROCESSING DATABASE MANAGEMENT SYSTEM (MPP DBMS)	6/19/2018	10003502
EMC IP Holding Company LLC	COMMUNICATION BETWEEN AN EXTERNAL PROCESSOR AND FPGA CONTROLLER	6/19/2018	10002087
EMC IP Holding Company LLC	FLASH MODULE	6/12/2018	9999154
EMC IP Holding Company LLC	STORAGE SYSTEM WITH SOLID- STATE STORAGE DEVICE HAVING ENHANCED WRITE BANDWIDTH OPERATING MODE	6/12/2018	9996291
EMC IP Holding Company LLC	PCB MODULE FOR INCREASED CONNECTIVITY	6/12/2018	9996120
EMC IP Holding Company LLC	SECURED VIRTUAL STORAGE APPLIANCE INSTALLATION IMAGE	6/5/2018	9990190
EMC IP Holding Company LLC	COMBINING HARDWARE AND SOFTWARE APPROACHES FOR INLINE DATA COMPRESSION	5/29/2018	9985649

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REEL: 060160 FRAME: 0910

Owner	Title	Date	Application No.
EMC IP Holding Company LLC	TECHNIQUES FOR AGGREGATING METRICS FOR VVOLS WITHIN A STORAGE CONTAINER	5/29/2018	9983814
EMC IP Holding Company LLC	VIRTUAL DATA STORAGE APPLIANCE WITH PLATFORM DETECTION BY USE OF VM-ACCESSIBLE RECORD	5/29/2018	9986023
EMC IP Holding Company LLC	SMOOTH RESTART OF STORAGE CLUSTERS IN A STORAGE SYSTEM	5/29/2018	9983937
EMC IP Holding Company LLC	LUN WITH ZERO STORAGE AS A PROTOCOL ENDPOINT	5/29/2018	9983896
EMC IP Holding Company LLC	STATIC SERVICE LEVELS AND APPLICATION SPECIFIC USAGE TAGS FOR STORAGE POLICY BASED MANAGEMENT OF STORAGE RESOURCES	5/29/2018	9983807
EMC IP Holding Company LLC	OPTIMIZING SPARE CAPACITY AND SPARE DISTRIBUTION	5/29/2018	9983931
EMC IP Holding Company LLC	GARBAGE COLLECTION SCOPE DETECTION FOR DISTRIBUTED STORAGE	5/25/2018	10061697
EMC IP Holding Company LLC	A SYSTEM AND METHOD FOR SMART THROTTLING MECHANISMS FOR VIRTUAL BACKUP APPLIANCES	5/22/2018	9977718
EMC IP Holding Company LLC	REAL-TIME POLICY MANAGEMENT OF DATA MANAGEMENT LIFE CYCLE	7/10/2018	10020996
EMC IP Holding Company LLC	TIME BASED CHECKPOINT RESTART	8/14/2018	10049012
EMC IP Holding Company LLC	MAGNETO-CALORIC COOLING SYSTEM	7/24/2018	10030896

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