**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

REALTIME DATA LLC d/b/a IXO,	C.A. No. _____
Plaintiff,	
v.	**JURY TRIAL DEMANDED**
HITACHI VANTARA CORPORATION, and HITACHI, LTD.,	
Defendants.	

COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement arising under the Patent Laws of the United States of America, 35 U.S.C. § 1 *et seq.* in which Plaintiff Realtime Data LLC d/b/a IXO ("Plaintiff," "Realtime," or "IXO") makes the following allegations against Defendants Hitachi Vantara Corporation and Hitachi, Ltd. (collectively, "Hitachi" or "Defendant"):

PARTIES

1.   Realtime is a limited liability company organized under the laws of the State of New York. Realtime has places of business at 5851 Legacy Circle, Plano, Texas 75024, 1828 E.S.E. Loop 323, Tyler, Texas 75701, and 66 Palmer Avenue, Suite 27, Bronxville, NY 10708. Since the 1990s, Realtime has researched and developed specific solutions for data compression, including, for example, those that increase the speeds at which data can be stored and accessed. As recognition of its innovations rooted in this technological field, Realtime holds 50 United States patents and has numerous pending patent applications. Realtime has licensed patents in this portfolio to many of the world's leading technology companies. The patents-in-suit relate to Realtime's development of

advanced systems and methods for fast and efficient data compression using numerous innovative compression techniques based on, for example, particular attributes of the data.

2.   On information and belief, Hitachi Vantara Corporation is a Delaware corporation with its principal place of business at 2845 Lafayette Street, Santa Clara, California 95050.   Hitachi can be served through its registered agent, Corporation Services Company, 251 Little Falls Drive, Wilmington, Delaware 19808. On information and belief, Hitachi, Ltd. is a Japanese corporation with its principal place of business at 6-6, Marunouchi 1-chome, Chiyoda-ku, Tokyo, 100-8280, Japan. Hitachi Vantara Corporation is a wholly owned subsidiary of Hitachi, Ltd. Hitachi Vantara Corporation and Hitachi, Ltd. are collectively referred herein as Hitachi.

JURISDICTION AND VENUE

3.   This action arises under the patent laws of the United States, Title 35 of the United States Code. This Court has original subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

4.   This Court has personal jurisdiction over Defendant Hitachi in this action because Hitachi Vantara is incorporated in Delaware and Hitachi has committed acts within the District of Delaware giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Hitachi would not offend traditional notions of fair play and substantial justice. Hitachi, directly and through subsidiaries or intermediaries, has committed and continues to commit acts of infringement in this District by, among other things, offering to sell and selling products and/or services that infringe the asserted patents.

5.   Venue is proper in this district under 28 U.S.C. § 1400(b).   Upon information and belief, Hitachi Vantara is incorporated in Delaware, Hitachi has transacted business in the District of Delaware, and Hitachi has committed acts of direct and indirect infringement in the District of Delaware.

COUNT I
INFRINGEMENT OF U.S. PATENT NO. 9,054,728

6.   Plaintiff realleges and incorporates by reference the foregoing paragraphs, as if fully set forth herein.

7.   Plaintiff Realtime is the owner by assignment of United States Patent No. 9,054,728 (the "'728 Patent") entitled "Data compression systems and methods." The '728 Patent was duly and legally issued by the United States Patent and Trademark Office on June 9, 2015. A true and correct copy of the '728 Patent is included as Exhibit A.

8.   On information and belief, Hitachi has offered for sale, sold and/or imported into the United States Hitachi products and services that infringe the '728 patent, and continues to do so. By way of illustrative example, these infringing products and services include, without limitation, Hitachi's products and services, *e.g.*, Storage Virtualization Operating System (SVOS), Unified Compute Platform HC Series, Unified Compute Platform 6000, Hitachi Virtual Storage Platform, Hitachi Content Platform, Hitachi NAS Platform 4000 Series, and the system hardware on which they operate, and all versions and variations thereof since the issuance of the '728 Patent ("Accused Instrumentalities").

9.   On information and belief, Hitachi has directly infringed and continues to infringe the '728 Patent, for example, by making, selling, offering for sale, and/or

importing the Accused Instrumentalities, and through its own use and testing of the Accused Instrumentalities, which constitute systems for compressing data claimed by Claim 1 of the '728 Patent, comprising: a processor; one or more content dependent data compression encoders; and a single data compression encoder; wherein the processor is configured: to analyze data within a data block to identify one or more parameters or attributes of the data wherein the analyzing of the data within the data block to identify the one or more parameters or attributes of the data excludes analyzing based solely on a descriptor that is indicative of the one or more parameters or attributes of the data within the data block; to perform content dependent data compression with the one or more content dependent data compression encoders if the one or more parameters or attributes of the data are identified; and to perform data compression with the single data compression encoder, if the one or more parameters or attributes of the data are not identified. Upon information and belief, Hitachi uses the Accused Instrumentalities, which are infringing systems, for its own internal non-testing business purposes, while testing the Accused Instrumentalities, and while providing technical support and repair services for the Accused Instrumentalities to Hitachi's customers.

10.   On information and belief, Hitachi has had knowledge of the '728 Patent since at least the filing of the original Complaint in this action, or shortly thereafter, and on information and belief, Hitachi knew of the '728 Patent and knew of its infringement, including by way of this lawsuit.

11.   Hitachi's affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentalities have induced and continue to induce users of the Accused Instrumentalities to use the Accused Instrumentalities in their

normal and customary way on compatible systems to infringe Claim 1 of the '728 Patent, knowing that when the Accused Instrumentalities are used in their ordinary and customary manner with such compatible systems, such systems constitute infringing systems for compressing data comprising; a processor; one or more content dependent data compression encoders; and a single data compression encoder; wherein the processor is configured: to analyze data within a data block to identify one or more parameters or attributes of the data wherein the analyzing of the data within the data block to identify the one or more parameters or attributes of the data excludes analyzing based solely on a descriptor that is indicative of the one or more parameters or attributes of the data within the data block; to perform content dependent data compression with the one or more content dependent data compression encoders if the one or more parameters or attributes of the data are identified; and to perform data compression with the single data compression encoder, if the one or more parameters or attributes of the data are not identified. For example, Hitachi explains to customers the benefits of using the Accused Instrumentalities, such as by touting their performance advantages: "SVOS data reduction engine AI is optimized for highest system throughput and response time consistency from the ground up." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. More specifically, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to

the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. Moreover, Hitachi's knowledge repository further specifies "[D]eduplication features the ability to reduce redundancy in stored data blocks. All data in the specified file system is scanned at intervals and duplicate blocks are removed, resulting in reclaimed disk space. Base deduplication is enabled by default and does not require a license key. This is a dedupe feature with a single SHA-256 engine, capable of indexing data at a rate of up to 120 MB per second." *See* https://knowledge.hitachivantara.com/Documents/Storage/NAS_Platform/13.2/NAS_Administration_Guides/File_Services_Administration_Guide/Dedupe_File_Systems. For similar reasons, Hitachi also induces its customers to use the Accused Instrumentalities to infringe other claims of the '728 Patent. Hitachi specifically intended and was aware that the normal and customary use of the Accused Instrumentalities on compatible systems would infringe the '728 Patent. Hitachi performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '728 Patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Hitachi engaged in such inducement to promote the sales of the Accused Instrumentalities, *e.g.,* through Hitachi's user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '728 Patent. Accordingly, Hitachi has induced and continues to induce end users of the accused products to use the accused products in their ordinary and customary way with compatible systems to make and/or use systems infringing the '728 Patent,

knowing that such use of the Accused Instrumentalities with compatible systems will result in infringement of the '728 Patent.

12.   The Accused Instrumentalities include a system for compressing data, comprising a processor. For example, Hitachi's SVOS 7 all-flash system "leverages and adaptive data reduction engine with a multistage metadata structure." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. Moreover, SVOS data reduction engine "has the ability to pause the data reduction processing once processor utilization reaches 70%." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

13.   The Accused Instrumentalities include a system for compressing data, comprising one or more content dependent data compression encoders. For example, the Accused Instrumentalities perform block-level deduplication, which is a content dependent data compression encoder. In particular, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. Performing deduplication results in compression by representing data with fewer bits.

14.   The Accused Instrumentalities comprise a single data compression encoder. For example, "SVOS 7 is built on lossless data compression LZ4 algorithm; LZ4 enables the highest compression and decompression speed. It belongs to the LZ77 family of byte-oriented compression schemes." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

15.   The Accused Instrumentalities analyze data within a data block to identify one or more parameters or attributes of the data, for example, whether the data is duplicative of data previously transmitted and/or stored, where the analysis does not rely only on the descriptor. For example, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

16.   The Accused Instrumentalities perform content dependent data compression with the one or more content dependent data compression encoders if the one or more parameters or attributes of the data are identified. For example, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are

validated with byte-to byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

17.   The Accused Instrumentalities perform data compression with the single data compression encoder, if the one or more parameters or attributes of the data are not identified. For example, "SVOS 7 is built on lossless data compression LZ4 algorithm; LZ4 enables the highest compression and decompression speed. It belongs to the LZ77 family of byte-oriented compression schemes." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. Hitachi also infringes other claims of the '728 Patent, directly and through indirect infringement.

18.   On information and belief, use of the Accused Instrumentalities in their ordinary and customary fashion results in infringement of the methods claimed by the '728 Patent.

19.   By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentalities, and touting the benefits of using the Accused Instrumentalities' compression features, Hitachi has injured Realtime and is liable to Realtime for infringement of the '728 Patent pursuant to 35 U.S.C. § 271.

20.   As a result of Hitachi's infringement of the '728 Patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Hitachi's infringement, but in no event less than a reasonable royalty for the use made of the invention by Hitachi, together with interest and costs as fixed by the Court.

COUNT II
INFRINGEMENT OF U.S. PATENT NO. 9,667,751

21.   Plaintiff realleges and incorporates by reference the foregoing paragraphs, as if fully set forth herein.

22.   Plaintiff Realtime is the owner by assignment of United States Patent No. 9,667,751 (the "'751 Patent") entitled "Data feed acceleration."   The '751 Patent was duly and legally issued by the United States Patent and Trademark Office on May 30, 2017. A true and correct copy of the '751 Patent is included as Exhibit B.

23.   On information and belief, Hitachi has offered for sale, sold and/or imported into the United States Hitachi products and services that infringe the '751 patent, and continues to do so. By way of illustrative example, these infringing products and services include, without limitation, Hitachi's products and services, *e.g.*, Storage Virtualization Operating System (SVOS), Unified Compute Platform HC Series, Unified Compute Platform 6000, Hitachi Virtual Storage Platform, Hitachi Content Platform, Hitachi NAS Platform 4000 Series, and the system hardware on which they operate, and all versions and variations thereof since the issuance of the '751 Patent ("Accused Instrumentalities").

24.   On information and belief, Hitachi has directly infringed and continues to infringe the '751 Patent, for example, through its own use and testing of the Accused Instrumentalities, which in the ordinary course of their operation form a system for compressing data claimed by Claim 25 of the '751 Patent, including: a data server implemented on one or more processors and one or more memory systems; the data server configured to analyze content of a data block to identify a parameter, attribute, or value of the data block that excludes analysis based solely on reading a descriptor; the

data server configured to select an encoder associated with the identified parameter, attribute, or value; the data server configured to compress data in the data block with the selected encoder to produce a compressed data block, wherein the compression utilizes a state machine; and the data server configured to store the compressed data block; wherein the time of the compressing the data block and the storing the compressed data block is less than the time of storing the data block in uncompressed form. Upon information and belief, Hitachi uses the Accused Instrumentalities, which are infringing systems, for its own internal non-testing business purposes, while testing the Accused Instrumentalities, and while providing technical support and repair services for the Accused Instrumentalities to Hitachi's customers.

26. On information and belief, Hitachi has had knowledge of the '751 Patent since at least the filing of the original Complaint in this action, or shortly thereafter, and on information and belief, Hitachi knew of the '751 Patent and knew of its infringement, including by way of this lawsuit.

26. Upon information and belief, Hitachi's affirmative acts of making, using, and selling the Accused Instrumentalities, and providing implementation services and technical support to users of the Accused Instrumentalities, have induced and continue to induce users of the Accused Instrumentalities to use them in their normal and customary way to infringe Claim 25 of the '751 Patent by making or using a data server implemented on one or more processors and one or more memory systems; the data server configured to analyze content of a data block to identify a parameter, attribute, or value of the data block that excludes analysis based solely on reading a descriptor; the data server configured to select an encoder associated with the identified parameter,
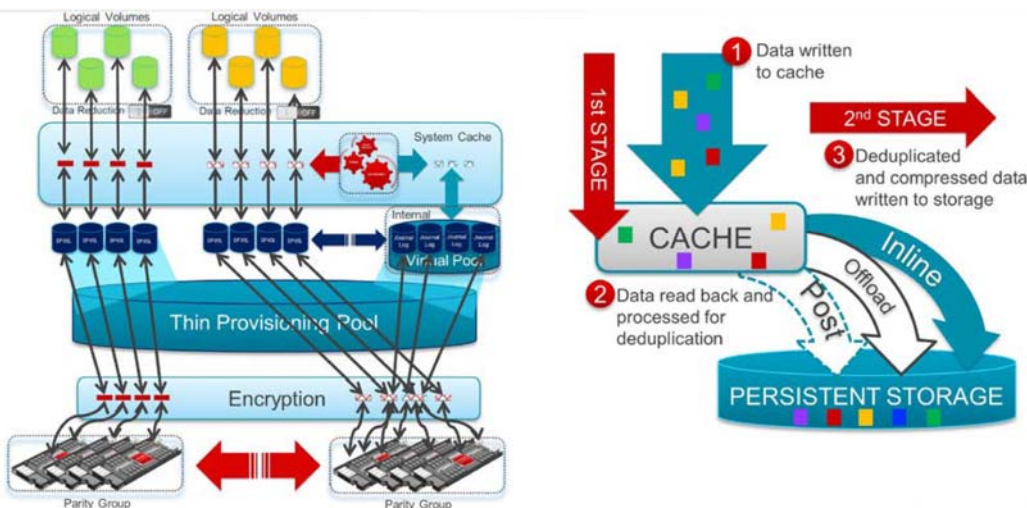
attribute, or value; the data server configured to compress data in the data block with the selected encoder to produce a compressed data block, wherein the compression utilizes a state machine; and the data server configured to store the compressed data block; wherein the time of the compressing the data block and the storing the compressed data block is less than the time of storing the data block in uncompressed form. For example, Hitachi explains to customers the benefits of using the Accused Instrumentalities, such as by touting their efficiency: "SVOS data reduction engine AI is optimized for highest system throughput and response time consistency from the ground up." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. More specifically, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. Moreover, Hitachi's knowledge repository further specifies "[D]eduplication features the ability to reduce redundancy in stored data blocks. All data in the specified file system is scanned at intervals and duplicate blocks are removed, resulting in reclaimed disk space. Base deduplication is enabled by default and does not require a license key. This is a dedupe feature with a single SHA-256 engine, capable of indexing data at a rate of up to 120 MB per second." *See* https://knowledge.hitachivantara.com/Documents/Storage/NAS_Platform/13.2/

NAS_Administration_Guides/File_Services_Administration_Guide/Dedupe_File_ Systems. For similar reasons, Hitachi also induces its customers to use the Accused Instrumentalities to infringe other claims of the '751 Patent. Hitachi specifically intended and was aware that these normal and customary activities would infringe the '751 Patent. Hitachi performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '751 Patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Hitachi engaged in such inducement to promote the sales of the Accused Instrumentalities. Accordingly, Hitachi has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '751 Patent, knowing that such use constitutes infringement of the '751 Patent.

27.   The Accused Instrumentalities include a system for compressing data. For example, Hitachi's SVOS 7 all-flash system "leverages and adaptive data reduction engine with a multistage metadata structure." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. For example, SVOS architecture shown below includes a data compression system
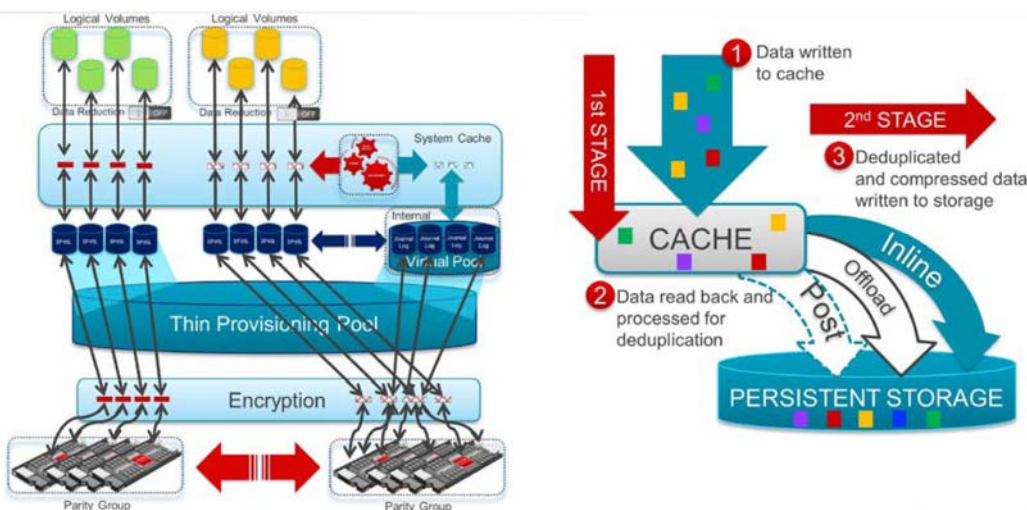
Figure 3. Hitachi SVOS All-Flash Architecture: Data Reduction Enhancements

See https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

28.   The Accused Instrumentalities include a data server implemented on one or more processors and one or more memory systems. For example, SVOS architecture shown below comprises one or more processors and one or more memory systems (e.g., System Cache, Logical Volume).

Figure 3. Hitachi SVOS All-Flash Architecture: Data Reduction Enhancements
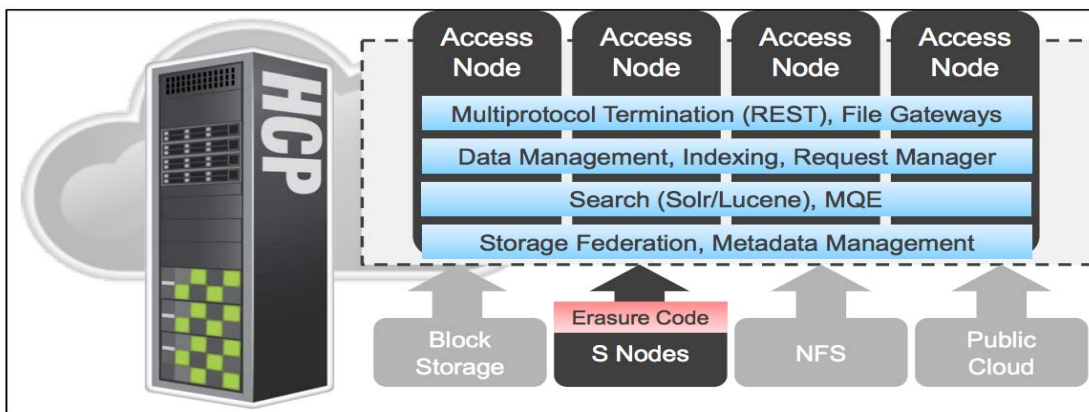
See   https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.   Moreover, SVOS data reduction engine "has the ability to pause the data reduction processing once processor utilization reaches 70%." *See*   https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. As another example, "HCP cloud storage software is deployed on hypervisors or dedicated servers called access nodes (HCP G series nodes). *See* https://www.hitachivantara.com/en-us/pdf/white-paper/content-platform-architecture-fundamentals-whitepaper.pdf.

Figure 2. Example of Access Nodes in HCP

See https://www.hitachivantara.com/en-us/pdf/white-paper/content-platform-architecture-fundamentals-whitepaper.pdf.   Thus, on information and belief, all of the Accused Instrumentalities use one or more memory systems in substantially the same way.

29.   The Accused Instrumentalities include a data server configured to analyze content of a data block to identify a parameter, attribute, or value of the data block that excludes analysis based solely on reading a descriptor. In particular, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity

by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.
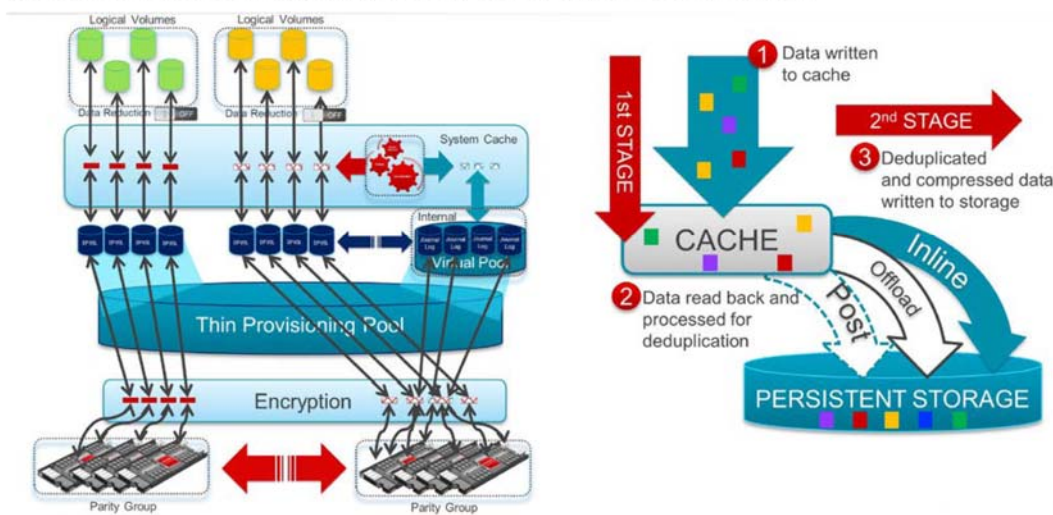
30.   The Accused Instrumentalities include a data server configured to select an encoder associated with the identified parameter, attribute, or value. For example, the Accused Instrumentalities select between deduplication or other compression. In particular, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

31.   The Accused Instrumentalities include a data server configured to compress data in the data block with the selected encoder to produce a compressed data block, wherein the compression utilizes a state machine. For example, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the

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single   copy." *See*   https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

32.   The Accused Instrumentalities include a data server configured to store the compressed data block. For example, the Accused Instrumentalities have storage devices that are managed by controllers. For example, SVOS architecture shown below comprises one or more memory systems (e.g., System Cache, Logical Volume, Persistent Storage) that store deduplicated and compressed data blocks.

Figure 3. Hitachi SVOS All-Flash Architecture: Data Reduction Enhancements

See   https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. On information and belief, all of the Accused Instrumentalities include a data server configured to store the compressed data block in substantially the same way.

33.   The time of the compressing the data block and the storing the compressed data block in the Accused Instrumentalities is less than the time of storing the data block in uncompressed form. Due to the data reduction and acceleration features of the specific compression algorithms used, the time of the compressing the data block and the storing

the compressed data block is less than the time of storing the data block in uncompressed form. For example, Hitachi explains "SVOS data reduction engine AI is optimized for highest system throughput and response time consistency from the ground up." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.   Hitachi supports the following data reduction functions that provide highest throughput: Pattern detection and removal, Deduplication, and Compression (deflate).   *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.   As another example, Hitachi Network Attached Storage (HNAS) module "provides primary data deduplication using hardware-based SHA-256 calculation engines. This module achieves up to 90% capacity savings while maintaining high performance." *See* "VSP G1000, VSP G1500, and VSP F1500 overview" at page 2.

34.   On information and belief, Hitachi also infringes, directly and through induced infringement, and continues to infringe other claims of the '751 Patent.

35.   On information and belief, use of the Accused Instrumentalities in their ordinary and customary fashion results in infringement of the methods claimed by the '751 Patent.

36.   By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentalities, and touting the benefits of using the Accused Instrumentalities' compression features, Hitachi has injured Realtime and is liable to Realtime for infringement of the '751 Patent pursuant to 35 U.S.C. § 271.

37.   As a result of Hitachi's infringement of the '751 Patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Hitachi's

infringement, but in no event less than a reasonable royalty for the use made of the invention by Hitachi, together with interest and costs as fixed by the Court.

COUNT III
INFRINGEMENT OF U.S. PATENT NO. 7,415,530

38.   Plaintiff realleges and incorporates by reference the foregoing paragraphs, as if fully set forth herein.

39.   Plaintiff Realtime is the owner by assignment of United States Patent No. 7,415,530 (the "'530 Patent") entitled "System and methods for accelerated data storage and retrieval." The '530 Patent was duly and legally issued by the United States Patent and Trademark Office on August 19, 2008. A true and correct copy of the '530 Patent is included as Exhibit C.

40.   On information and belief, Hitachi has made, used, offered for sale, sold and/or imported into the United States Hitachi products that infringe the '530 Patent, and continues to do so. By way of illustrative example, these infringing products include, without limitation, Hitachi's products and services, e.g., Storage Virtualization Operating System (SVOS), Unified Compute Platform HC Series, Unified Compute Platform 6000, Hitachi Virtual Storage Platform, Hitachi Content Platform, Hitachi NAS Platform 4000 Series, and all versions and variations thereof since the issuance of the '530 patent ("Accused Instrumentality").

41.   On information and belief, Hitachi has directly infringed and continues to infringe the '530 Patent, for example, through its own use and testing of the Accused Instrumentality, which constitutes a system comprising: a memory device; and a data accelerator, wherein said data accelerator is coupled to said memory device, a data stream is received by said data accelerator in received form, said data stream includes a first data

block and a second data block, said data stream is compressed by said data accelerator to provide a compressed data stream by compressing said first data block with a first compression technique and said second data block with a second compression technique, said first and second compression techniques are different, said compressed data stream is stored on said memory device, said compression and storage occurs faster than said data stream is able to be stored on said memory device in said received form, a first data descriptor is stored on said memory device indicative of said first compression technique, and said first descriptor is utilized to decompress the portion of said compressed data stream associated with said first data block. Upon information and belief, Hitachi uses the Accused Instrumentality, an infringing system, for its own internal non-testing business purposes, while testing the Accused Instrumentality, and while providing technical support and repair services for the Accused Instrumentality to Hitachi's customers.

42.   On information and belief, Hitachi has had knowledge of the '530 Patent since at least the filing of this Complaint or shortly thereafter, and on information and belief, Hitachi knew of the '530 Patent and knew of its infringement, including by way of this lawsuit.

43.   Upon information and belief, Hitachi's affirmative acts of making, using, and selling the Accused Instrumentalities, and providing implementation services and technical support to users of the Accused Instrumentalities, have induced and continue to induce users of the Accused Instrumentalities to use them in their normal and customary way to infringe Claim 1 of the '530 Patent by making or using a system comprising: a memory device; and a data accelerator, wherein said data accelerator is coupled to said

memory device, a data stream is received by said data accelerator in received form, said data stream includes a first data block and a second data block, said data stream is compressed by said data accelerator to provide a compressed data stream by compressing said first data block with a first compression technique and said second data block with a second compression technique, said first and second compression techniques are different, said compressed data stream is stored on said memory device, said compression and storage occurs faster than said data stream is able to be stored on said memory device in said received form, a first data descriptor is stored on said memory device indicative of said first compression technique, and said first descriptor is utilized to decompress the portion of said compressed data stream associated with said first data block.

44.   For example, Hitachi explains to customers the benefits of using the Accused Instrumentality: "SVOS data reduction engine AI is optimized for highest system throughput and response time consistency from the ground up." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.   More specifically, Hitachi provides "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the single   copy." *See*   https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.   Moreover, Hitachi's knowledge repository further specifies "[D]eduplication features the ability to reduce redundancy in

stored data blocks. All data in the specified file system is scanned at intervals and duplicate blocks are removed, resulting in reclaimed disk space. Base deduplication is enabled by default and does not require a license key. This is a dedupe feature with a single SHA-256 engine, capable of indexing data at a rate of up to 120 MB per second." *See* https://knowledge.hitachivantara.com/Documents/Storage/NAS_Platform/13.2/ NAS_Administration_Guides/File_Services_Administration_Guide/Dedupe_File_ Systems.

45.   Hitachi also induces its customers to use the Accused Instrumentalities to infringe other claims of the '530 Patent. Hitachi specifically intended and was aware that these normal and customary activities would infringe the '530 Patent. Hitachi performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '530 Patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Hitachi engaged in such inducement to promote the use of the Accused Instrumentalities. Accordingly, Hitachi has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '530 Patent, knowing that such use constitutes infringement of the '530 Patent.

46.   Hitachi also indirectly infringes the '530 Patent by manufacturing, using, selling, offering for sale, and/or importing the accused products, with knowledge that the accused products were and are especially manufactured and/or especially adapted for use in infringing the '530 Patent and are not a staple article or commodity of commerce suitable for substantial non-infringing use. On information and belief, the Accused

Instrumentality is designed to function with compatible hardware to create a system comprising: a memory device; and a data accelerator, wherein said data accelerator is coupled to said memory device, a data stream is received by said data accelerator in received form, said data stream includes a first data block and a second data block, said data stream is compressed by said data accelerator to provide a compressed data stream by compressing said first data block with a first compression technique and said second data block with a second compression technique, said first and second compression techniques are different, said compressed data stream is stored on said memory device, said compression and storage occurs faster than said data stream is able to be stored on said memory device in said received form, a first data descriptor is stored on said memory device indicative of said first compression technique, and said first descriptor is utilized to decompress the portion of said compressed data stream associated with said first data block. Because the Accused Instrumentality is designed to operate as the claimed system for compressing, the Accused Instrumentality has no substantial non-infringing uses, and any other uses would be unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental. Hitachi's manufacture, use, sale, offering for sale, and/or importation of the Accused Instrumentality constitutes contributory infringement of the '530 Patent.

47.	The Accused Instrumentality includes the memory device and includes the data accelerator, wherein said data accelerator is coupled to said memory device. For example, SVOS architecture shown below includes one or more memory devices (e.g., System Cache, Logical Volume) and a data accelerator (e.g., data reduction engine)
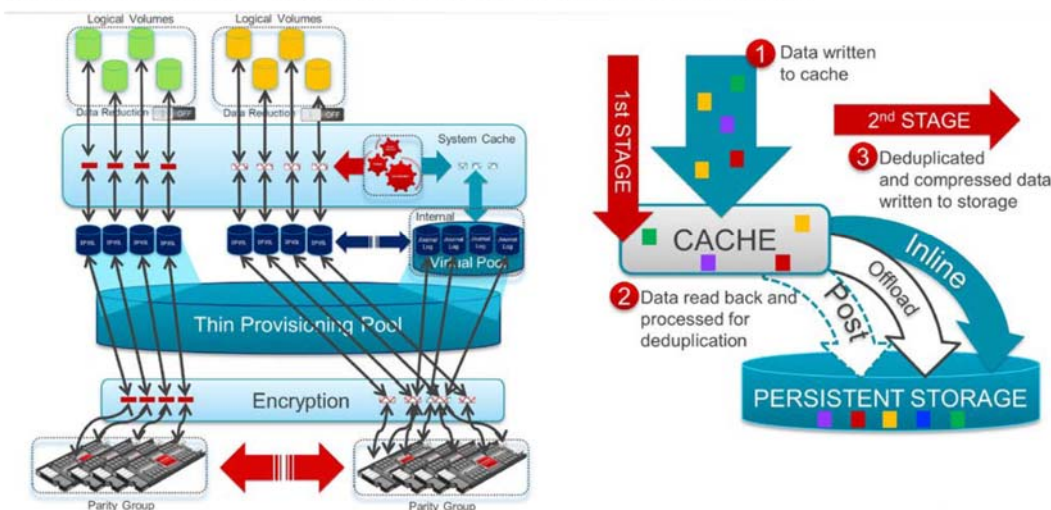
23

Figure 3. Hitachi SVOS All-Flash Architecture: Data Reduction Enhancements
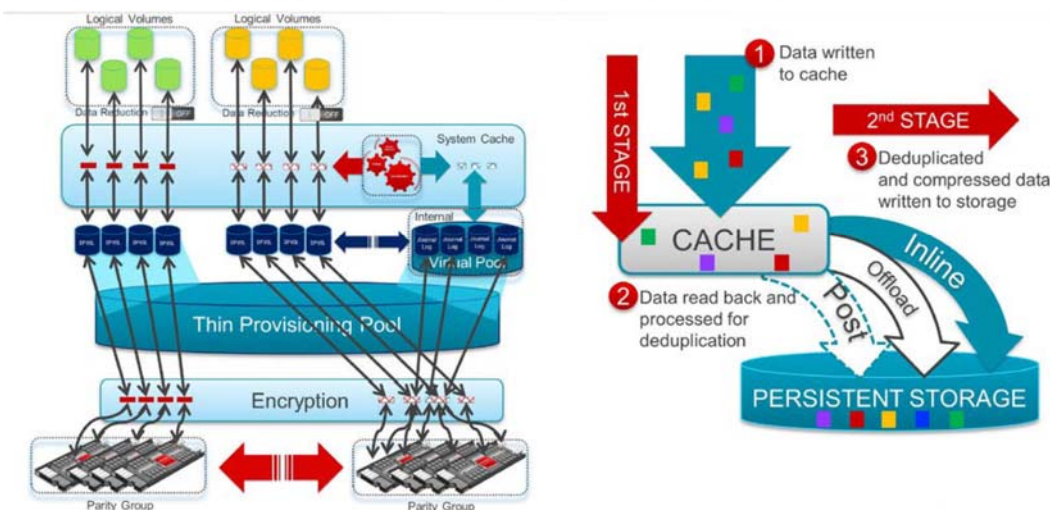
See https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. As another example, Hitachi discloses that SVOS 7 all-flash system "leverages and adaptive data reduction engine with a multistage metadata structure." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

48.   The Accused Instrumentality receives an incoming stream of data. In Figure 3 shown below, incoming data stream comprises more than one data block (e.g., 1st stage).
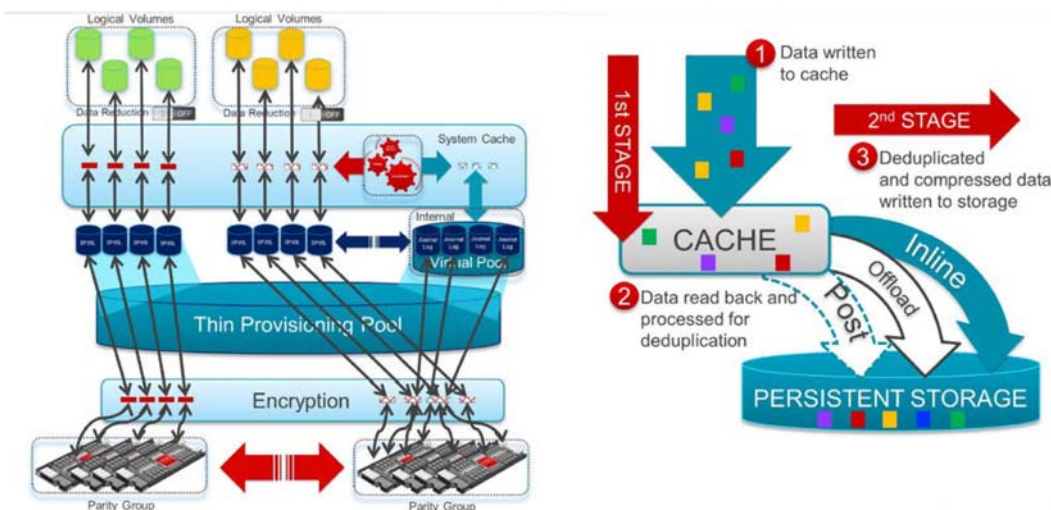
Figure 3. Hitachi SVOS All-Flash Architecture: Data Reduction Enhancements

See https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

49.   The Accused Instrumentality's received data stream comprise more than one data block. For example, Hitachi discloses that deduplication engine "removes duplicate data without compromising the fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks. *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.   Moreover, in Figure 3 shown below, incoming data stream comprises more than one data block (e.g., 1st stage).

Figure 3. Hitachi SVOS All-Flash Architecture: Data Reduction Enhancements

See https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

50.   The Accused Instrumentality compresses said data stream to provide a compressed data stream by compressing said first data block with a first compression technique and said second data block with a second compression technique.   For example, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.   Moreover, "SVOS 7 is built on lossless data compression LZ4 algorithm; LZ4 enables the highest compression and decompression speed. It belongs to the LZ77 family of byte-oriented compression   schemes."   *See*   https://www.hitachivantara.com/en-us/pdfd/white-

paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

51.   The first and second compression techniques used by the Accused Instrumentality described above are different. As such, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.   Moreover, "SVOS 7 is built on lossless data compression LZ4 algorithm; LZ4 enables the highest compression and decompression speed. It belongs to the LZ77 family of byte-oriented compression schemes." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

52.   After compression, said compressed data stream is stored on said memory device. For example, SVOS architecture shown below comprises one or more memory systems (e.g., System Cache, Logical Volume, Persistent Storage) that store compressed data stream.

Figure 3. Hitachi SVOS All-Flash Architecture: Data Reduction Enhancements

See https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.
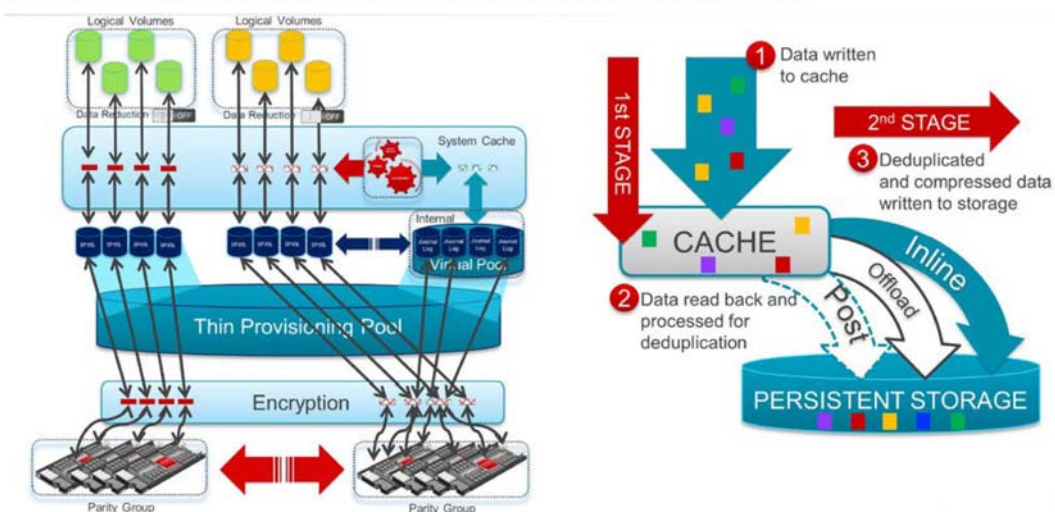
53.   Said compression and storage occurs faster than said data stream is able to be stored on said memory device in said received form. For example, Hitachi explains "SVOS data reduction engine AI is optimized for highest system throughput and response time consistency from the ground up." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. Hitachi supports the following data reduction functions that provide highest throughput: Pattern detection and removal, Deduplication, and Compression (deflate). *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. As another example, Hitachi Network Attached Storage (HNAS) module "provides primary data deduplication using hardware-based SHA-256 calculation engines. This module achieves up to 90% capacity savings while maintaining high performance." *See* "VSP G1000, VSP G1500, and VSP F1500 overview" at page 2.

54.   The Accused Instrumentality stores a first data descriptor on said memory device indicative of said first compression technique, such as a reference to a single copy of deduplicated data block. For example, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

55.   On information and belief, Hitachi also infringes, directly and through induced infringement and contributory infringement, and continues to infringe other claims of the '530 Patent.

56.   On information and belief, use of the Accused Instrumentality in its ordinary and customary fashion results in infringement of the methods claimed by the '530 Patent.

57.   By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentalities, and touting the benefits of using the Accused Instrumentalities' compression features, Hitachi has injured Realtime and is liable to Realtime for infringement of the '530 Patent pursuant to 35 U.S.C. § 271.

58.   As a result of Hitachi's infringement of the '530 Patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Hitachi's infringement, but in no event less than a reasonable royalty for the use made of the

invention by Hitachi, together with interest and costs as fixed by the Court.

COUNT IV
INFRINGEMENT OF U.S. PATENT NO. 9,116,908

59.   Plaintiff Realtime realleges and incorporates by reference the foregoing paragraphs, as if fully set forth herein.

60.   Plaintiff Realtime is the owner by assignment of United States Patent No. 9,116,908 (the "'908 Patent") entitled "System and methods for accelerated data storage and retrieval." The '908 Patent was duly and legally issued by the United States Patent and Trademark Office on August 25, 2015, and Claims 1, 2, 4-6, 9, 11, 21, 22, 24, and 25 of the '908 Patent confirmed as patentable in a Final Written Decision of the Patent Trial and Appeal Board on October 31, 2017. A true and correct copy of the '908 Patent is included as Exhibit D.

61.   On information and belief, Hitachi has offered for sale, sold and/or imported into the United States Hitachi products and services that infringe the '908 Patent, and continues to do so. By way of illustrative example, these infringing products and services include, without limitation, Hitachi's products and services, *e.g.*, Storage Virtualization Operating System (SVOS), Unified Compute Platform HC Series, Unified Compute Platform 6000, Hitachi Virtual Storage Platform, Hitachi Content Platform, Hitachi NAS Platform 4000 Series, and the system hardware on which they operate, and all versions and variations thereof since the issuance of the '908 Patent (the "Accused Instrumentality").

62.   On information and belief, Hitachi has directly infringed and continues to infringe the '908 Patent, for example, through its own use and testing of the Accused Instrumentality, which constitutes a system comprising: a memory device; and a data

accelerator configured to compress: (i) a first data block with a first compression technique to provide a first compressed data block; and (ii) a second data block with a second compression technique, different from the first compression technique, to provide a second compressed data block; wherein the compressed first and second data blocks are stored on the memory device, and the compression and storage occurs faster than the first and second data blocks are able to be stored on the memory device in uncompressed form. Upon information and belief, Hitachi uses the Accused Instrumentality, an infringing system, for its own internal non-testing business purposes, while testing the Accused Instrumentality, and while providing technical support and repair services for the Accused Instrumentality to Hitachi's customers.

63.   On information and belief, use of the Accused Instrumentality in its ordinary and customary fashion results in infringement of the systems claimed by the '908 Patent.

64.   On information and belief, Hitachi has had knowledge of the '908 Patent since at least the filing of this First Amended Complaint or shortly thereafter, and on information and belief, Hitachi knew of the '908 Patent and knew of its infringement, including by way of this lawsuit.

65.   Upon information and belief, Hitachi's affirmative acts of making, using, and selling the Accused Instrumentalities, and providing implementation services and technical support to users of the Accused Instrumentalities, have induced and continue to induce users of the Accused Instrumentalities to use them in their normal and customary way to infringe Claim 1 of the '908 Patent by making or using a system comprising: a memory device; and a data accelerator configured to compress: (i) a first data block with

a first compression technique to provide a first compressed data block; and (ii) a second data block with a second compression technique, different from the first compression technique, to provide a second compressed data block; wherein the compressed first and second data blocks are stored on the memory device, and the compression and storage occurs faster than the first and second data blocks are able to be stored on the memory device in uncompressed form. For example, Hitachi explains to customers the benefits of using the Accused Instrumentalities, such as by touting their performance advantages: "SVOS data reduction engine AI is optimized for highest system throughput and response time consistency from the ground up." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

More specifically, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

Moreover, Hitachi's knowledge repository further specifies "[D]eduplication features the ability to reduce redundancy in stored data blocks. All data in the specified file system is scanned at intervals and duplicate blocks are removed, resulting in reclaimed disk space. Base deduplication is enabled by default and does not require a license key. This is a dedupe feature with a single SHA-256 engine, capable of indexing data at a rate of up to

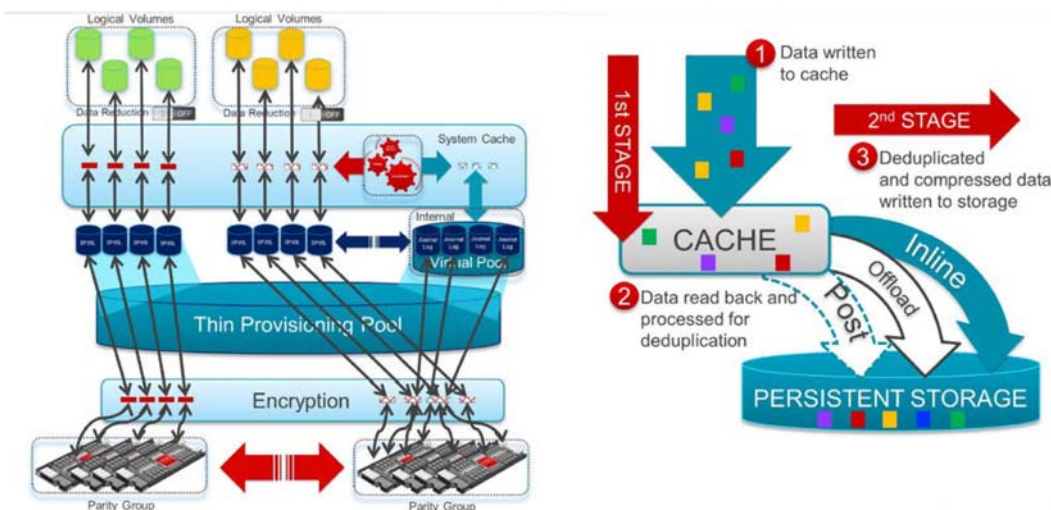120   MB   per   second."   *See*

https://knowledge.hitachivantara.com/Documents/Storage/NAS_Platform/13.2/

NAS_Administration_Guides/File_Services_Administration_Guide/Dedupe_File_

Systems.   For similar reasons, Hitachi also induces its customers to use the Accused

Instrumentalities to infringe other claims of the '908 Patent. Hitachi specifically intended

and was aware that these normal and customary activities would infringe the '908 Patent.

Hitachi performed the acts that constitute induced infringement, and would induce actual

infringement, with the knowledge of the '908 Patent and with the knowledge, or willful

blindness to the probability, that the induced acts would constitute infringement.   On

information and belief, Hitachi engaged in such inducement to promote the sales of the

Accused Instrumentalities.   Accordingly, Hitachi has induced and continues to induce

users of the accused products to use the accused products in their ordinary and customary

way to infringe the '908 Patent, knowing that such use constitutes infringement of

the '908 Patent.

66.   The Accused Instrumentality includes a memory device and a data

accelerator configured to compress: (i) a first data block with a first compression

technique (e.g., deduplication) to provide a first compressed data block; and (ii) a second

data block with a second compression technique (e.g., another compression), different

from the first compression technique, to provide a second compressed data block. For

example, the Accused Instrumentalities memory devices, including e.g., System Cache,

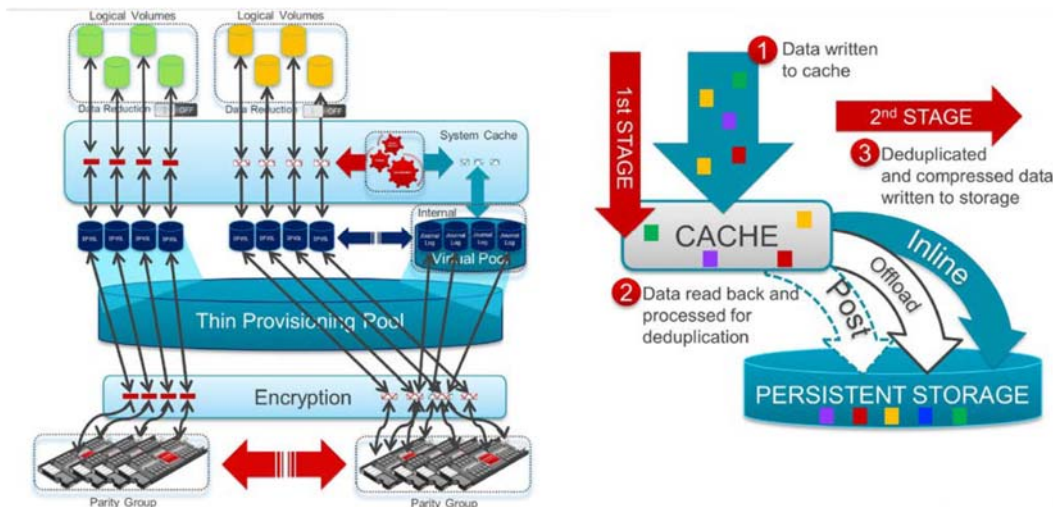Logical Volume, Persistent Storage shown below.

Figure 3. Hitachi SVOS All-Flash Architecture: Data Reduction Enhancements

See https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. Hitachi includes a data accelerator comprising a data deduplication and compression engines. For example, "SVOS 7 implementation is built on a crypto hash fingerprint using SHA-1 algorithm. This function finds and removes duplicate data without compromising its fidelity or integrity by segmenting a page into small fixed-sized 8KB chunks, identifying duplicate chunks, and maintaining a single copy of each chunk. Redundant copies of each chunk are validated with byte-to-byte comparison against data and are replaced by a reference to the single copy." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf. For example, "SVOS 7 is built on lossless data compression LZ4 algorithm; LZ4 enables the highest compression and decompression speed. It belongs to the LZ77 family of byte-oriented compression schemes." *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

67.   The Accused Instrumentality stores the compressed first and second data blocks on the memory device. For example, SVOS architecture shown below comprises one or more memory systems (e.g., System Cache, Logical Volume, Persistent Storage) that store deduplicated and compressed data blocks.

Figure 3. Hitachi SVOS All-Flash Architecture: Data Reduction Enhancements

See   https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

The compression and storage occurs faster than the first and second data blocks are able to be stored on the memory device in uncompressed form. For example, Hitachi explains "SVOS data reduction engine AI is optimized for highest system throughput and response time consistency from the ground up."   *See*   https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.

Hitachi supports the following data reduction functions that provide highest throughput: Pattern detection and removal, Deduplication, and Compression (deflate).   *See* https://www.hitachivantara.com/en-us/pdfd/white-paper/hitachi-whitepaper-storage-virtualization-operating-system.pdf.   As another example, Hitachi Network Attached

Storage (HNAS) module "provides primary data deduplication using hardware-based SHA-256 calculation engines. This module achieves up to 90% capacity savings while maintaining high performance." *See* "VSP G1000, VSP G1500, and VSP F1500 overview" at page 2.

68.   On information and belief, Hitachi also infringes, directly and through induced infringement, and continues to infringe other claims of the '908 Patent.

69.   By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentalities, and touting the benefits of using the Accused Instrumentalities' compression features, Hitachi has injured Realtime and is liable to Realtime for infringement of the '908 Patent pursuant to 35 U.S.C. § 271.

70.   As a result of Hitachi's infringement of the '908 Patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Hitachi's infringement, but in no event less than a reasonable royalty for the use made of the invention by Hitachi, together with interest and costs as fixed by the Court.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff Realtime respectfully requests that this Court enter:

a.   A judgment in favor of Plaintiff that Hitachi has infringed, either literally and/or under the doctrine of equivalents, the '728 Patent, the '751 Patent, the '530 Patent, and the '908 Patent;

b.   A permanent injunction prohibiting Hitachi from further acts of infringement of the '728 Patent, the '751 Patent, the '530 Patent, and the '908 Patent;

c.   A judgment and order requiring Hitachi to pay Plaintiff its damages, costs, expenses, and prejudgment and post-judgment interest for its infringement of the '728 Patent, the '751 Patent, the '530 Patent, and the '908 Patent; and

d.   A judgment and order requiring Hitachi to provide an accounting and to pay supplemental damages to Realtime, including without limitation, prejudgment and post-judgment interest;

e.   A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Plaintiff its reasonable attorneys' fees against Defendants; and

f.   Any and all other relief as the Court may deem appropriate and just under the circumstances.

<u>**DEMAND FOR JURY TRIAL**</u>

Plaintiff, under Rule 38 of the Federal Rules of Civil Procedure, requests a trial by jury of any issues so triable by right.

Dated: August 3, 2018   BAYARD, P.A.

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