IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION

REALTIME DATA LLC d/b/a IXO, Plaintiff, v. ORACLE AMERICA, INC., Defendant.	Case No. _____ JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT AGAINST

ORACLE AMERICA, INC.

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 Defendant Oracle America, Inc. ("Oracle" or "Defendant"):

PARTIES

1. Realtime is a New York limited liability company. 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 over 45 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, Defendant Oracle America, Inc. ("Oracle") is a Delaware corporation with its principal office at 500 Oracle Parkway, Redwood City, California 94065. On information and belief, Oracle can be served through its registered agent, Corporation Service Company d/b/a CSC-Lawyers Inco, 211 E. 7th Street Suite 620, Austin, Texas 78701.

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 Oracle in this action because Oracle has committed acts within the Eastern District of Texas giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Oracle would not offend traditional notions of fair play and substantial justice. Defendant Oracle, directly and through subsidiaries or intermediaries (including distributors, retailers, and others), 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. Oracle is registered to do business in the State of Texas and has appointed Corporation Service Company d/b/a CSC-Lawyers Inco, 211 E. 7th Street Suite 620, Austin, Texas 78701 as its agent for service of process.

5. Venue is proper in this district under 28 U.S.C. §§ 1391(b), 1391(c) and 1400(b). Defendant Oracle is registered to do business in Texas, and upon information and belief, has transacted business in the Eastern District of Texas and has committed acts of direct and indirect infringement in the Eastern District of Texas.

COUNT I

INFRINGEMENT OF U.S. PATENT NO. 6,597,812

6. Plaintiff realleges and incorporates by reference paragraphs 1-5 above, as

if fully set forth herein.

7. Plaintiff Realtime is the owner by assignment of United States Patent No. 6,597,812 ("812 patent") entitled "System and method for lossless data compression and decompression." The '812 patent was duly and legally issued by the United States Patent and Trademark Office on July 22, 2003. A true and correct copy of the '812 Patent is included as Exhibit A.

Hybrid Columnar Compression

8. On information and belief, Oracle has used, offered for sale, sold and/or imported into the United States Oracle products that infringe the '812 patent, and continues to do so. By way of illustrative example, these infringing products include, without limitation, Oracle's products and services, such as those incorporating, e.g., Hybrid Columnar Compression, and all versions and variations thereof since the issuance of the '812 patent ("Accused Instrumentality").

9. On information and belief, Oracle has directly infringed and continues to infringe the '812 patent, for example, through its own use and testing of the Accused Instrumentality, which constitutes a system for compressing input data comprising a plurality of data blocks, the system comprising: a dictionary comprising a plurality of code words, wherein the code words comprise control code words and code words that are each mapped to a unique data block string; a run-length encoder for encoding a sequence of similar data blocks in the input data using at least one code word in the dictionary; and a dictionary encoder for encoding a data block string comprising at least one data block in the input data using a code word in the dictionary, wherein output of the run-length encoder and dictionary encoder are combined to form an encoded data stream. Upon information and belief, Oracle 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 Oracle's customers.

10. On information and belief, Oracle has had knowledge of the '812 patent since at least the filing of the original Complaint in E.D. Tex. Case No. 6:16-cv-00088 on May 8, 2015 or shortly thereafter, and on information and belief, Oracle knew of the '812 patent and knew of its infringement, including by way of this lawsuit.

11. Oracle's affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentality has induced and continues to induce users of the accused products to use the accused products in their normal and customary way on compatible systems, including Exadata, to infringe the '812 patent, knowing that when the Accused Instrumentality is used in its ordinary and customary manner with such compatible systems, such systems constitute infringing systems comprising: a dictionary comprising a plurality of code words, wherein the code words comprise control code words and code words that are each mapped to a unique data block string; a run-length encoder for encoding a sequence of similar data blocks in the input data using at least one code word in the dictionary; and a dictionary encoder for encoding a data block string comprising at least one data block in the input data using a code word in the dictionary, wherein output of the run-length encoder and dictionary encoder are combined to form an encoded data stream. For example, Oracle explains to customers the benefits of using the Accused Instrumentality, e.g., that use of HCC typically results in 6x to 10x compression ratios when QUERY compression is used, increasing query performance, and 10x to 15x compression ratios when ARCHIVE compression is used. See https://www.oracle.com/us/assets/lad-2015-ses16380-pedregal-2604876.pdf at 11; http://www.oracle.com/technetwork/articles/servers-storage-admin/perf-hybrid-columnar-compression-1689701.html ("Oracle Database-aware technologies have the advantage of compressing the data before it's sent to the storage system, which generally results in the movement of less data and higher performance. Additionally, because the compression is fully integrated with Oracle Database, queries often can run directly on the compressed data."). Oracle specifically intended and was aware that the normal and

customary use of the Accused Instrumentality on compatible systems, including Exadata, would infringe the '812 patent. Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '812 patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Oracle engaged in such inducement to promote the sales of the Accused Instrumentality, *e.g.,* through Oracle's user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '812 patent. Accordingly, Oracle 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, including Exadata, to make and/or use systems infringing the '812 patent, knowing that such use of the Accused Instrumentality with compatible systems, including Exadata, will result in infringement of the '812 patent.

12. Oracle also indirectly infringes the '812 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 '812 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, including Exadata, to create a system for compressing input data comprising a plurality of data blocks, the system comprising: a dictionary comprising a plurality of code words, wherein the code words comprise control code words and code words that are each mapped to a unique data block string; a run-length encoder for encoding a sequence of similar data blocks in the input data using at least one code word in the dictionary; and a dictionary encoder for encoding a data block string comprising at least one data block in the input data using a code word in the dictionary, wherein output of the run-length encoder and dictionary encoder are combined to form an encoded data stream. Because the Accused

Instrumentality is designed to operate as the claimed system for compressing input data, the Accused Instrumentality has no substantial non-infringing uses, and any other uses would be unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental. Oracle's manufacture, use, sale, offering for sale, and/or importation of the Accused Instrumentality constitutes contributory infringement of the '812 patent.

13. The Accused Instrumentality is a system for compressing input data comprising a plurality of data blocks. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression.").

14. The Accused Instrumentality comprises a dictionary comprising a plurality of code words, wherein the code words comprise control code words and code words that are each mapped to a unique data block string. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression. … the second is bitwise compression (e.g. OZIP, LZO, ZLIB, BZ2 etc).")." Bitwise compression techniques such as LZO and ZLIB maintain a dictionary comprising a plurality of code words, wherein the code words comprise control code words and code words that are each mapped to a unique data block string.

15. The Accused Instrumentality comprises a run-length encoder for encoding a sequence of similar data blocks in the input data using at least one code word in the dictionary. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression. The first is semantic compression (e.g. dictionary encoding, run-length encoding etc etc)").

16. The Accused Instrumentality comprises a dictionary encoder for encoding a data block string comprising at least one data block in the input data using a code word in the dictionary, wherein output of the run-length encoder and dictionary encoder are

combined to form an encoded data stream. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression. The first is semantic compression (e.g. dictionary encoding, run-length encoding etc etc) and the second is bitwise compression (e.g. OZIP, LZO, ZLIB, BZ2 etc). After HCC data is read from disk it has to be decompressed from the bitwise compression but is then processed still semantically compressed.").

17. Oracle also infringes other claims of the '812 patent, directly and through inducing infringement and contributory infringement, for similar reasons as explained above with respect to Claim 28 of the '812 patent.

18. By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentality, and touting the benefits of using the Accused Instrumentality's compression features, Oracle has injured Realtime and is liable to Realtime for infringement of the '812 patent pursuant to 35 U.S.C. § 271.

19. As a result of Oracle's infringement of the '812 patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Oracle's infringement, but in no event less than a reasonable royalty for the use made of the invention by Oracle, together with interest and costs as fixed by the Court.

COUNT II

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

20. Plaintiff realleges and incorporates by reference paragraphs 1-19 above, as if fully set forth herein.

21. 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 B.

Hybrid Columnar Compression

22. On information and belief, Oracle has offered for sale, sold and/or imported into the United States Oracle products that infringe the '728 patent, and continues to do so. By way of illustrative example, these infringing products include, without limitation, Oracle's products and services, such as those incorporating, e.g., Hybrid Columnar Compression, and all versions and variations thereof since the issuance of the '728 patent ("Accused Instrumentality").

23. On information and belief, Oracle has directly infringed and continues to infringe the '728 patent, for example, through its own use and testing of the Accused Instrumentality, 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, Oracle 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 Oracle's customers.

24. On information and belief, Oracle has had knowledge of the '728 patent since at least the filing of the original Complaint in E.D. Tex. Case No. 6:16-cv-00088 on February 26, 2016 or shortly thereafter, and on information and belief, Oracle knew of

the '728 patent and knew of its infringement, including by way of this lawsuit.

25. Oracle's affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentality has induced and continues to induce users of the Accused Instrumentality to use the Accused Instrumentality in its normal and customary way on compatible systems, including Exadata, to infringe the '728 patent, knowing that when the Accused Instrumentality is used in its 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, Oracle explains to customers the benefits of using the Accused Instrumentality, e.g., that use of HCC typically results in 6x to 10x compression ratios when QUERY compression is used, increasing query performance, and 10x to 15x compression ratios when ARCHIVE compression is used. See https://www.oracle.com/us/assets/lad-2015-ses16380-pedregal-2604876.pdf at 11; http://www.oracle.com/technetwork/articles/servers-storage-admin/perf-hybrid-columnar-compression-1689701.html ("Oracle Database-aware technologies have the advantage of compressing the data before it's sent to the storage system, which generally results in the movement of less data and higher performance. Additionally, because the compression is fully integrated with Oracle Database, queries often can run directly on

the compressed data."). Oracle specifically intended and was aware that the normal and customary use of the Accused Instrumentality on compatible systems, including Exadata, would infringe the '728 patent. Oracle 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, Oracle engaged in such inducement to promote the sales of the Accused Instrumentality, *e.g.,* through Oracle'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, Oracle 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, including Exadata, to make and/or use systems infringing the '728 patent, knowing that such use of the Accused Instrumentality with compatible systems, including Exadata, will result in infringement of the '728 patent.

26. Oracle also indirectly infringes the '728 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 '728 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, including Exadata, to create 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. Because the Accused Instrumentality is designed to operate as the claimed system for compressing input data, the Accused Instrumentality has no substantial non-infringing uses, and any other uses would be unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental. Oracle's manufacture, use, sale, offering for sale, and/or importation of the Accused Instrumentality constitutes contributory infringement of the '728 patent.

27. The Accused Instrumentality is a system for compressing data, comprising a processor. For example, HCC is a part of the Oracle database software and cannot be used without a processor. Oracle includes HCC with processor, including, e.g., in hardware products that it sells (e.g., Exadata, Oracle Database Cloud Services, Pillar Axiom, ZFS Storage Appliance, etc.). See, e.g., http://www.hroug.hr/content/download/4827/73804/file/414_Kobal%20HCC%20.pdf at 3 ("Takes advantages of the processing power … of Exadata storage server … Hybrid Columnar Compression extended to Pillar Axiom and Sun ZFS Storage Appliance"); http://www.oracle.com/technetwork/server-storage/sun-unified-storage/documentation/problemsolver-hcc-52014-2202692.pdf at 4 ("Implementing Hybrid Columnar Compression on the Oracle ZFS Storage Appliance … Oracle ZFS Storage platforms offer faster CPUs"); http://www.oracle.com/us/corporate/press/508020 ("Hybrid Columnar Compression, pioneered in Oracle Exadata , is now supported on Oracle's Sun ZFS Storage Appliances and Pillar Axiom Storage Systems."); http://www.oracle.com/technetwork/database/exadata/exadata-x5-2-ds-2406241.pdf at 2 ("Oracle Exadata Database Machine X5-2 … Up to 684 CPU cores").

28. The Accused Instrumentality is a system for compressing data, comprising one or more content dependent data compression encoders. For example, HCC includes

Run Length Encoder, which is a content dependent data compression encoder. Performing Run Length Encoding in HCC results in representation of data with fewer bits. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression. The first is semantic compression (e.g. dictionary encoding, run-length encoding etc etc)").

29. The Accused Instrumentality comprises a single data compression encoder. For example, HCC's LZO, ZLIB, and BZ2 are each one data compression encoder. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression. … the second is bitwise compression (e.g. OZIP, LZO, ZLIB, BZ2 etc).").").

30. The Accused Instrumentality analyzes data within a data block to identify one or more parameters or attributes of the data where the analysis does not rely only on the descriptor. HCC analyzes data within a data block to determine whether there are run-length sequences of data (i.e. plural consecutive matching data blocks). See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression. The first is semantic compression (e.g. dictionary encoding, run-length encoding etc etc)"). A run-length sequence is a parameter or attribute of the data, and indicates whether or not HCC should perform Run-Length Encoding. The analysis of determining run-length sequences of data of HCC's Run Length Encoding and Compression Analyzer is not based solely on a descriptor. For instance, examining whether there are plural consecutive matching data is not based solely on a descriptor (e.g., file extension or other descriptor) but rather involves looking at the content of the data.

31. The Accused Instrumentality performs 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, HCC Run-Length Encoding is applied when HCC identifies that there is a run-length sequence of data (i.e., plural consecutive matching data blocks). See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression. The first is semantic compression (e.g. dictionary encoding, run-length encoding etc etc)").

32. The Accused Instrumentality performs data compression with the single data compression encoder, if the one or more parameters or attributes of the data are not identified. For example, HCC performs LZO, ZLIB, or BZ2 on data not identified to be part of a run-length sequence. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression. … the second is bitwise compression (e.g. OZIP, LZO, ZLIB, BZ2 etc).").").

33. Oracle also infringes other claims of the '728 patent, directly and through inducing infringement and contributory infringement, for similar reasons as explained above with respect to Claim 1 of the '728 patent.

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

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

COUNT III

INFRINGEMENT OF U.S. PATENT NO. 8,643,513

36. Plaintiff realleges and incorporates by reference paragraphs 1-35 above, as if fully set forth herein.

37. Plaintiff Realtime is the owner by assignment of United States Patent No. 8,643,513 ("the '513 patent") entitled "Data compression systems and methods." The '513 patent was duly and legally issued by the United States Patent and Trademark Office on February 4, 2014. A true and correct copy of the '513 Patent is included as Exhibit C.

Hybrid Columnar Compression

38. On information and belief, Oracle has offered for sale, sold and/or imported into the United States Oracle products that infringe the '513 patent, and continues to do so. By way of illustrative example, these infringing products include, without limitation, Oracle's products and services, such as those incorporating, e.g., Hybrid Columnar Compression, and all versions and variations thereof since the issuance of the '513 patent ("Accused Instrumentality").

39. On information and belief, Oracle has directly infringed and continues to infringe the '513 patent, for example, through its own use and testing of the accused products to practice compression methods claimed by the '513 patent, including a method of compressing a plurality of data blocks, comprising: analyzing the plurality of data blocks to recognize when an appropriate content independent compression algorithm is to be applied to the plurality of data blocks; applying the appropriate content independent data compression algorithm to a portion of the plurality of data blocks to provide a compressed data portion; analyzing a data block from another portion of the plurality of data blocks for recognition of any characteristic, attribute, or parameter that is indicative of an appropriate content dependent algorithm to apply to the data block; and applying the appropriate content dependent data compression algorithm to the data block to provide a compressed data block when the characteristic, attribute, or parameter is

identified, wherein the analyzing the plurality of data blocks to recognize when the appropriate content independent compression algorithm is to be applied excludes analyzing based only on a descriptor indicative of the any characteristic, attribute, or parameter, and wherein the analyzing the data block to recognize the any characteristic, attribute, or parameter excludes analyzing based only on the descriptor. On information and belief, Oracle uses the Accused Instrumentality in its ordinary and customary fashion 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 Oracle's customers, and use of the Accused Instrumentality in its ordinary and customary fashion results in infringement of the methods claimed by the '513 patent.

40. On information and belief, Oracle has had knowledge of the '513 patent since at least the filing of the Complaint in E.D. Tex. Case No. 6:15-cv-00467 on May 8, 2015 or shortly thereafter, and on information and belief, Oracle knew of the '513 patent and knew of its infringement, including by way of this lawsuit.

41. Oracle's affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentality have induced and continue to induce users of the Accused Instrumentality to use the Accused Instrumentality in its normal and customary way to infringe the '513 patent by practicing compression methods claimed by the '513 patent, including a method of compressing a plurality of data blocks, comprising: analyzing the plurality of data blocks to recognize when an appropriate content independent compression algorithm is to be applied to the plurality of data blocks; applying the appropriate content independent data compression algorithm to a portion of the plurality of data blocks to provide a compressed data portion; analyzing a data block from another portion of the plurality of data blocks for recognition of any characteristic, attribute, or parameter that is indicative of an appropriate content dependent algorithm to apply to the data block; and applying the appropriate content

dependent data compression algorithm to the data block to provide a compressed data block when the characteristic, attribute, or parameter is identified, wherein the analyzing the plurality of data blocks to recognize when the appropriate content independent compression algorithm is to be applied excludes analyzing based only on a descriptor indicative of the any characteristic, attribute, or parameter, and wherein the analyzing the data block to recognize the any characteristic, attribute, or parameter excludes analyzing based only on the descriptor. For example, Oracle explains to customers the benefits of using the Accused Instrumentality, e.g., that use of HCC typically results in 6x to 10x compression ratios when QUERY compression is used, increasing query performance, and 10x to 15x compression ratios when ARCHIVE compression is used. See https://www.oracle.com/us/assets/lad-2015-ses16380-pedregal-2604876.pdf at 11; http://www.oracle.com/technetwork/articles/servers-storage-admin/perf-hybrid-columnar-compression-1689701.html ("Oracle Database-aware technologies have the advantage of compressing the data before it's sent to the storage system, which generally results in the movement of less data and higher performance. Additionally, because the compression is fully integrated with Oracle Database, queries often can run directly on the compressed data."). Oracle specifically intended and was aware that the normal and customary use of the Accused Instrumentality would infringe the '513 patent. Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '513 patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Oracle engaged in such inducement to promote the sales of the Accused Instrumentality, *e.g.,* through Oracle's user manuals, product support, marketing materials, and training materials to actively induce the users of the Accused Instrumentality to infringe the '513 patent. Accordingly, Oracle has induced and continues to induce users of the Accused Instrumentality to use the Accused Instrumentality in its ordinary and customary way to infringe the '513 patent, knowing

that such use constitutes infringement of the '513 patent.

42. The Accused Instrumentality practices a method of compressing a plurality of data blocks. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression.").

43. The Accused Instrumentality analyzes the plurality of data blocks to recognize when an appropriate content independent compression algorithm is to be applied to the plurality of data blocks and applies the appropriate content independent data compression algorithm to a portion of the plurality of data blocks to provide a compressed data portion. For example, HCC will compress data using LZO, ZLIB, or BZ2, which are content independent data compression algorithms, that is determined not to be part of a run-length sequence. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression. The first is semantic compression (e.g. dictionary encoding, run-length encoding etc etc) and the second is bitwise compression (e.g. OZIP, LZO, ZLIB, BZ2 etc). After HCC data is read from disk it has to be decompressed from the bitwise compression but is then processed still semantically compressed.").

44. The Accused Instrumentality analyzes a data block from another portion of the plurality of data blocks for recognition of any characteristic, attribute, or parameter that is indicative of an appropriate content dependent algorithm to apply to the data block; and applies the appropriate content dependent data compression algorithm to the data block to provide a compressed data block when the characteristic, attribute, or parameter is identified. For example, HCC analyzes data within a data block to determine whether there are run-length sequences of data (i.e. plural consecutive matching data blocks), and applies Run-Length Encoding, a content dependent algorithm, to such sequences if identified. See, e.g., https://blogs.oracle.com/smartscan-deep-

dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression. The first is semantic compression (e.g. dictionary encoding, run-length encoding etc etc)").

45. In the Accused Instrumentality, the analysis of the plurality of data blocks to recognize when the appropriate content independent compression algorithm is to be applied excludes analyzing based only on a descriptor indicative of the any characteristic, attribute, or parameter. For example, the analysis of determining that data is not part of a run-length sequence is not based solely on a descriptor, because examining whether or not there are a plurality of consecutive matching data is not based solely on a descriptor (e.g., file extension or other descriptor) but rather involves examining the content (e.g. values) of the data itself.

46. In the Accused Instrumentality, the analysis of the data block to recognize the any characteristic, attribute, or parameter excludes analyzing based only on the descriptor. For example, the analysis of determining whether data is part of a run-length sequence is not based solely on a descriptor, because examining whether there are a plurality of consecutive matching data is not based solely on a descriptor (e.g., file extension or other descriptor) but rather involves examining the content (e.g. values) of the data itself.

47. Oracle also infringes other claims of the '513 patent, directly and through inducing infringement, for similar reasons as explained above with respect to Claim 1 of the '513 patent.

48. By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentality, and touting the benefits of using the Accused Instrumentality's compression features, Oracle has injured Realtime and is liable to Realtime for infringement of the '513 patent pursuant to 35 U.S.C. § 271.

49. As a result of Oracle's infringement of the '513 patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Oracle's

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

COUNT IV

INFRINGEMENT OF U.S. PATENT NO. 7,358,867

50. Plaintiff realleges and incorporates by reference paragraphs 1-49 above, as if fully set forth herein.

51. Plaintiff Realtime is the owner by assignment of United States Patent No. 7,358,867 ("'867 patent") entitled "Content independent data compression method and system." The '867 patent was duly and legally issued by the United States Patent and Trademark Office on April 15, 2008. A true and correct copy of the '867 Patent is included as Exhibit D.

Hybrid Columnar Compression

52. On information and belief, Oracle has offered for sale, sold and/or imported into the United States Oracle products that infringe the '867 patent, and continues to do so. By way of illustrative example, these infringing products include, without limitation, Oracle's products and services, such as those incorporating, e.g., Hybrid Columnar Compression, and all versions and variations thereof since the issuance of the '867 patent ("Accused Instrumentality").

53. On information and belief, Oracle has directly infringed and continues to infringe the '867 patent, for example, through its own use and testing of the accused products to practice compression methods claimed by the '867 patent, including a method comprising: receiving as input a data stream comprising at least one data block; compressing said data block with a plurality of encoders; determining the encoder from said plurality of encoders that achieved the highest compression ratio; providing a compressed data block from the encoder from said plurality of encoders that achieved the highest compression ratio; and providing a data compression type descriptor,

representative of the encoder that provided the highest compression ratio, with said compressed data block. On information and belief, Oracle uses the Accused Instrumentality in its ordinary and customary fashion 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 Oracle's customers, and use of the Accused Instrumentality in its ordinary and customary fashion results in infringement of the methods claimed by the '867 patent.

54. On information and belief, Oracle has had knowledge of the '867 patent since at least the filing of the Complaint in E.D. Tex. Case No. 6:16-cv-00088 on February 26, 2016 or shortly thereafter, and on information and belief, Oracle knew of the '867 patent and knew of its infringement, including by way of this lawsuit.

55. Oracle's affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentality have induced and continue to induce users of the Accused Instrumentality to use the Accused Instrumentality in its normal and customary way to infringe the '867 patent by practicing compression methods claimed by the '867 patent, including a method comprising: receiving as input a data stream comprising at least one data block; compressing said data block with a plurality of encoders; determining the encoder from said plurality of encoders that achieved the highest compression ratio; providing a compressed data block from the encoder from said plurality of encoders that achieved the highest compression ratio; and providing a data compression type descriptor, representative of the encoder that provided the highest compression ratio, with said compressed data block. For example, Oracle explains to customers the benefits of using the Accused Instrumentality, e.g., that use of HCC typically results in 6x to 10x compression ratios when QUERY compression is used, increasing query performance, and 10x to 15x compression ratios when ARCHIVE compression is used. See https://www.oracle.com/us/assets/lad-2015-ses16380-pedregal-2604876.pdf at 11; http://www.oracle.com/technetwork/articles/servers-storage-

admin/perf-hybrid-columnar-compression-1689701.html ("Oracle Database-aware technologies have the advantage of compressing the data before it's sent to the storage system, which generally results in the movement of less data and higher performance. Additionally, because the compression is fully integrated with Oracle Database, queries often can run directly on the compressed data."). Oracle specifically intended and was aware that the normal and customary use of the Accused Instrumentality would infringe the '867 patent. Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '867 patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Oracle engaged in such inducement to promote the sales of the Accused Instrumentality, *e.g.,* through Oracle's user manuals, product support, marketing materials, and training materials to actively induce the users of the Accused Instrumentality to infringe the '867 patent. Accordingly, Oracle has induced and continues to induce users of the Accused Instrumentality to use the Accused Instrumentality in its ordinary and customary way to infringe the '867 patent, knowing that such use constitutes infringement of the '867 patent.

56. The Accused Instrumentality practices a method comprising: receiving as input a data stream comprising at least one data block; compressing said data block with a plurality of encoders. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression.").

57. The Accused Instrumentality determines the encoder from said plurality of encoders that achieved the highest compression ratio. For example, the Accused Instrumentality analyzes the input data and determines the encoders among semantic compression (e.g., run-length encoding, etc.) and bitwise compression (e.g., LZO, ZLIB, BZ2, etc.) that achieved the highest compression ratio.

58. The Accused Instrumentality provides a compressed data block from the

encoder from said plurality of encoders that achieved the highest compression ratio. For example, the Accused Instrumentality provides a compressed data block from encoders among semantic compression (e.g., run-length encoding, etc.) and bitwise compression (e.g., LZO, ZLIB, BZ2, etc.) that achieved the highest compression ratio.

59. The Accused Instrumentality provides a data compression type descriptor, representative of the encoder that provided the highest compression ratio, with said compressed data block. For example, the Accused Instrumentality provides a descriptor representative of the encoders among semantic compression (e.g., run-length encoding, etc.) and bitwise compression (e.g., LZO, ZLIB, BZ2, etc.) that achieved the highest compression ratio.

60. Oracle also infringes other claims of the '867 patent, directly and through inducing infringement, for similar reasons as explained above with respect to Claim 1 of the '867 patent.

61. By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentality, and touting the benefits of using the Accused Instrumentality's compression features, Oracle has injured Realtime and is liable to Realtime for infringement of the '867 patent pursuant to 35 U.S.C. § 271.

62. As a result of Oracle's infringement of the '867 patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Oracle's infringement, but in no event less than a reasonable royalty for the use made of the invention by Oracle, together with interest and costs as fixed by the Court.

Essbase

63. On information and belief, Oracle has offered for sale, sold and/or imported into the United States Oracle products that infringe the '867 patent, and continues to do so. By way of illustrative example, these infringing products include, without limitation, Oracle's products and services, such as those incorporating, e.g., Essbase, and all versions and variations thereof since the issuance of the '867 patent

("Accused Instrumentality").

64. On information and belief, Oracle has directly infringed and continues to infringe the '867 patent, for example, through its own use and testing of the accused products to practice compression methods claimed by the '867 patent, including a method comprising: receiving as input a data stream comprising at least one data block; compressing said data block with a plurality of encoders; determining the encoder from said plurality of encoders that achieved the highest compression ratio; providing a compressed data block from the encoder from said plurality of encoders that achieved the highest compression ratio; and providing a data compression type descriptor, representative of the encoder that provided the highest compression ratio, with said compressed data block. On information and belief, Oracle uses the Accused Instrumentality in its ordinary and customary fashion 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 Oracle's customers, and use of the Accused Instrumentality in its ordinary and customary fashion results in infringement of the methods claimed by the '867 patent.

65. On information and belief, Oracle has had knowledge of the '867 patent since at least the filing of the Complaint in E.D. Tex. Case No. 6:16-cv-00088 on February 26, 2016 or shortly thereafter, and on information and belief, Oracle knew of the '867 patent and knew of its infringement, including by way of this lawsuit.

66. Oracle's affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentality have induced and continue to induce users of the Accused Instrumentality to use the Accused Instrumentality in its normal and customary way to infringe the '867 patent by practicing compression methods claimed by the '867 patent, including a method comprising: receiving as input a data stream comprising at least one data block; compressing said data block with a plurality of encoders; determining the encoder from said plurality of encoders that achieved the

highest compression ratio; providing a compressed data block from the encoder from said plurality of encoders that achieved the highest compression ratio; and providing a data compression type descriptor, representative of the encoder that provided the highest compression ratio, with said compressed data block. For example, Oracle explains that, "For example, if the user selects RLE, Essbase reviews each block and evaluates the following compression types for highest compression: RLE, bitmap, or Index Value Pair." See https://docs.oracle.com/cd/E12825_01/epm.111/esb_dbag/frameset.htm?dstalloc.htm. Oracle specifically intended and was aware that the normal and customary use of the Accused Instrumentality would infringe the '867 patent. Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '867 patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Oracle engaged in such inducement to promote the sales of the Accused Instrumentality, *e.g.,* through Oracle's user manuals, product support, marketing materials, and training materials to actively induce the users of the Accused Instrumentality to infringe the '867 patent. Accordingly, Oracle has induced and continues to induce users of the Accused Instrumentality to use the Accused Instrumentality in its ordinary and customary way to infringe the '867 patent, knowing that such use constitutes infringement of the '867 patent.

67. The Accused Instrumentality practices a method comprising: receiving as input a data stream comprising at least one data block; compressing said data block with a plurality of encoders. See, e.g., https://docs.oracle.com/cd/E12825_01/epm.111/esb_dbag/frameset.htm?dstalloc.htm ("You can choose from four compression settings: bitmap (the default), RLE, zlib, or None.").

68. The Accused Instrumentality determines the encoder from said plurality of

encoders that achieved the highest compression ratio. See, e.g., https://docs.oracle.com/cd/E12825_01/epm.111/esb_dbag/frameset.htm?dstalloc.htm ("Index Value Pair addresses compression on databases with larger block sizes, where the blocks are highly sparse. This compression algorithm is not selectable but is automatically used whenever appropriate by the database. The user must still choose between the compression types None, bitmap, RLE, and zlib through Administration Services. For example, if the user selects RLE, Essbase reviews each block and evaluates the following compression types for highest compression: RLE, bitmap, or Index Value Pair.").

69. The Accused Instrumentality provides a compressed data block from the encoder from said plurality of encoders that achieved the highest compression ratio. See, e.g., https://docs.oracle.com/cd/E12825_01/epm.111/esb_dbag/frameset.htm?dstalloc.htm ("Index Value Pair addresses compression on databases with larger block sizes, where the blocks are highly sparse. This compression algorithm is not selectable but is automatically used whenever appropriate by the database. The user must still choose between the compression types None, bitmap, RLE, and zlib through Administration Services. For example, if the user selects RLE, Essbase reviews each block and evaluates the following compression types for highest compression: RLE, bitmap, or Index Value Pair. … The following table illustrates the available compression types the user can choose and the compression types that Essbase evaluates and then applies.").

70. The Accused Instrumentality provides a data compression type descriptor, representative of the encoder that provided the highest compression ratio, with said compressed data block. Because the Accused Instrumentality chooses among multiple encoders based on which compression type has the highest compression, it must also provide a descriptor indicating the compression type to enable the appropriate compression decoder to be used when the compressed data is retrieved. See, e.g.,

https://docs.oracle.com/cd/E12825_01/epm.111/esb_dbag/frameset.htm?dstalloc.htm ("Index Value Pair addresses compression on databases with larger block sizes, where the blocks are highly sparse. This compression algorithm is not selectable but is automatically used whenever appropriate by the database. The user must still choose between the compression types None, bitmap, RLE, and zlib through Administration Services. For example, if the user selects RLE, Essbase reviews each block and evaluates the following compression types for highest compression: RLE, bitmap, or Index Value Pair. … The following table illustrates the available compression types the user can choose and the compression types that Essbase evaluates and then applies.").

71. Oracle also infringes other claims of the '867 patent, directly and through inducing infringement, for similar reasons as explained above with respect to Claim 1 of the '867 patent.

72. By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentality, and touting the benefits of using the Accused Instrumentality's compression features, Oracle has injured Realtime and is liable to Realtime for infringement of the '867 patent pursuant to 35 U.S.C. § 271.

73. As a result of Oracle's infringement of the '867 patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Oracle's infringement, but in no event less than a reasonable royalty for the use made of the invention by Oracle, together with interest and costs as fixed by the Court.

Advanced Row Compression

74. On information and belief, Oracle has offered for sale, sold and/or imported into the United States Oracle products that infringe the '867 patent, and continues to do so. By way of illustrative example, these infringing products include, without limitation, Oracle's products and services, such as those incorporating, e.g., Advanced Row Compression, and all versions and variations thereof since the issuance of the '867 patent ("Accused Instrumentality").

75. On information and belief, Oracle has directly infringed and continues to infringe the '867 patent, for example, through its own use and testing of the accused products to practice compression methods claimed by the '867 patent, including a method comprising: receiving a plurality of data blocks; determining whether or not to compress each one of said plurality of data blocks with a particular one or more of several encoders; if said determination is to compress with said particular one or more of said several encoders for a particular one of said plurality of data blocks: compressing said particular one of said plurality of data blocks with said particular one or more of said several encoders to provide a compressed data block; providing a data compression type descriptor representative of said particular one or more of said several encoders; outputting said data compression type descriptor and said compressed data block; if said determination is to not compress said particular one of said plurality of data blocks; providing a null data compression type descriptor representative of said determination not to compress; and outputting said null data compression type descriptor and said particular one of said plurality of data blocks. On information and belief, Oracle uses the Accused Instrumentality in its ordinary and customary fashion 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 Oracle's customers, and use of the Accused Instrumentality in its ordinary and customary fashion results in infringement of the methods claimed by the '867 patent.

76. On information and belief, Oracle has had knowledge of the '867 patent since at least the filing of the Complaint in E.D. Tex. Case No. 6:16-cv-00088 on February 26, 2016 or shortly thereafter, and on information and belief, Oracle knew of the '867 patent and knew of its infringement, including by way of this lawsuit.

77. Oracle's affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentality have induced and continue to induce users of the Accused Instrumentality to use the Accused Instrumentality in its normal and

customary way to infringe the '867 patent by practicing compression methods claimed by the '867 patent, including a method comprising: receiving a plurality of data blocks; determining whether or not to compress each one of said plurality of data blocks with a particular one or more of several encoders; if said determination is to compress with said particular one or more of said several encoders for a particular one of said plurality of data blocks: compressing said particular one of said plurality of data blocks with said particular one or more of said several encoders to provide a compressed data block; providing a data compression type descriptor representative of said particular one or more of said several encoders; outputting said data compression type descriptor and said compressed data block; if said determination is to not compress said particular one of said plurality of data blocks; providing a null data compression type descriptor representative of said determination not to compress; and outputting said null data compression type descriptor and said particular one of said plurality of data blocks. For example, Oracle explains that, "The compression ratio achieved in a given environment depends on the data being compressed, specifically the cardinality of the data. In general, organizations can expect to reduce their storage space consumption by a factor of 2x to 4x by using Advanced Row Compression. That is, the amount of space consumed by uncompressed data will be two to four times larger than that of the compressed data. The benefits of Advanced Row Compression go beyond just on-disk storage savings. One significant advantage is Oracle's ability to read compressed blocks (data and indexes) directly, in memory, without uncompressing the blocks. This helps improve performance due to the reduction in I/O, and the reduction in system calls related to the I/O operations. Further, the buffer cache becomes more efficient by storing more data without having to add memory." See http://www.oracle.com/technetwork/database/options/compression/advanced-compression-wp-12c-1896128.pdf at 7. Oracle specifically intended and was aware that the normal and customary use of the Accused Instrumentality would infringe the '867

patent. Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '867 patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Oracle engaged in such inducement to promote the sales of the Accused Instrumentality, *e.g.,* through Oracle's user manuals, product support, marketing materials, and training materials to actively induce the users of the Accused Instrumentality to infringe the '867 patent. Accordingly, Oracle has induced and continues to induce users of the Accused Instrumentality to use the Accused Instrumentality in its ordinary and customary way to infringe the '867 patent, knowing that such use constitutes infringement of the '867 patent.

78. The Accused Instrumentality practices a method comprising: receiving a plurality of data blocks. See, e.g., http://www.oracle.com/technetwork/database/options/compression/advanced-compression-wp-12c-1896128.pdf at 7 ("Advanced Row Compression uses a unique compression algorithm specifically designed to work with OLTP applications. The algorithm works by eliminating duplicate values within a database block, even across multiple columns.").

79. The Accused Instrumentality determines whether or not to compress each one of said plurality of data blocks with a particular one or more of several encoders. See, e.g., http://www.oracle.com/technetwork/database/options/compression/advanced-compression-wp-12c-1896128.pdf at 7-8 ("Compressed blocks contain a structure called a symbol table that maintains compression metadata. When a block is compressed, duplicate values are eliminated by first adding a single copy of the duplicate value to the symbol table. Each duplicate value is then replaced by a short reference to the appropriate entry in the symbol table. … Oracle Database compresses blocks in batch mode rather than compressing data every time a write operation takes place. A newly initialized block remains uncompressed until data in the block reaches an internally controlled threshold.

When a transaction causes the data in the block to reach this threshold, all contents of the block are compressed. Subsequently, as more data is added to the block and the threshold is again reached, the entire block is recompressed to achieve the highest level of compression. This process repeats until Oracle determines that the block can no longer benefit from further compression.").

80. If said determination is to compress with said particular one or more of said several encoders for a particular one of said plurality of data blocks, the Accused Instrumentality compresses said particular one of said plurality of data blocks with said particular one or more of said several encoders to provide a compressed data block. See, e.g., http://www.oracle.com/technetwork/database/options/compression/advanced-compression-wp-12c-1896128.pdf at 7-8 ("Compressed blocks contain a structure called a symbol table that maintains compression metadata. When a block is compressed, duplicate values are eliminated by first adding a single copy of the duplicate value to the symbol table. Each duplicate value is then replaced by a short reference to the appropriate entry in the symbol table. … Oracle Database compresses blocks in batch mode rather than compressing data every time a write operation takes place. A newly initialized block remains uncompressed until data in the block reaches an internally controlled threshold. When a transaction causes the data in the block to reach this threshold, all contents of the block are compressed. Subsequently, as more data is added to the block and the threshold is again reached, the entire block is recompressed to achieve the highest level of compression. This process repeats until Oracle determines that the block can no longer benefit from further compression.").

81. The Accused Instrumentality provides a data compression type descriptor representative of said particular one or more of said several encoders. See, e.g., http://www.oracle.com/technetwork/database/options/compression/advanced-compression-wp-12c-1896128.pdf at 7-8 ("Compressed blocks contain a structure called a symbol table that maintains compression metadata. When a block is compressed,

duplicate values are eliminated by first adding a single copy of the duplicate value to the symbol table. Each duplicate value is then replaced by a short reference to the appropriate entry in the symbol table. … Oracle Database compresses blocks in batch mode rather than compressing data every time a write operation takes place. A newly initialized block remains uncompressed until data in the block reaches an internally controlled threshold. When a transaction causes the data in the block to reach this threshold, all contents of the block are compressed. Subsequently, as more data is added to the block and the threshold is again reached, the entire block is recompressed to achieve the highest level of compression. This process repeats until Oracle determines that the block can no longer benefit from further compression.").

82. The Accused Instrumentality outputs said data compression type descriptor and said compressed data block. See, e.g., http://www.oracle.com/technetwork/database/options/compression/advanced-compression-wp-12c-1896128.pdf at 7 ("Compressed blocks contain a structure called a symbol table that maintains compression metadata. When a block is compressed, duplicate values are eliminated by first adding a single copy of the duplicate value to the symbol table. Each duplicate value is then replaced by a short reference to the appropriate entry in the symbol table. Through this innovative design, compressed data is self-contained within the database block, as the metadata used to translate compressed data into its original state is stored in the block header. … Oracle Database compresses blocks in batch mode rather than compressing data every time a write operation takes place. A newly initialized block remains uncompressed until data in the block reaches an internally controlled threshold. When a transaction causes the data in the block to reach this threshold, all contents of the block are compressed. Subsequently, as more data is added to the block and the threshold is again reached, the entire block is recompressed to achieve the highest level of compression. This process repeats until Oracle determines that the block can no longer benefit from further compression.").

83. If said determination is to not compress said particular one of said plurality of data blocks, the Accused Instrumentality provides a null data compression type descriptor representative of said determination not to compress. See, e.g., http://www.oracle.com/technetwork/database/options/compression/advanced-compression-wp-12c-1896128.pdf at 7 ("Compressed blocks contain a structure called a symbol table that maintains compression metadata. When a block is compressed, duplicate values are eliminated by first adding a single copy of the duplicate value to the symbol table. Each duplicate value is then replaced by a short reference to the appropriate entry in the symbol table. Through this innovative design, compressed data is self-contained within the database block, as the metadata used to translate compressed data into its original state is stored in the block header. … Oracle Database compresses blocks in batch mode rather than compressing data every time a write operation takes place. A newly initialized block remains uncompressed until data in the block reaches an internally controlled threshold. When a transaction causes the data in the block to reach this threshold, all contents of the block are compressed. Subsequently, as more data is added to the block and the threshold is again reached, the entire block is recompressed to achieve the highest level of compression. This process repeats until Oracle determines that the block can no longer benefit from further compression.").

84. The Accused Instrumentality outputs said null data compression type descriptor and said particular one of said plurality of data blocks. See, e.g., http://www.oracle.com/technetwork/database/options/compression/advanced-compression-wp-12c-1896128.pdf at 7 ("Compressed blocks contain a structure called a symbol table that maintains compression metadata. When a block is compressed, duplicate values are eliminated by first adding a single copy of the duplicate value to the symbol table. Each duplicate value is then replaced by a short reference to the appropriate entry in the symbol table. Through this innovative design, compressed data is self-contained within the database block, as the metadata used to translate compressed data

into its original state is stored in the block header. … Oracle Database compresses blocks in batch mode rather than compressing data every time a write operation takes place. A newly initialized block remains uncompressed until data in the block reaches an internally controlled threshold. When a transaction causes the data in the block to reach this threshold, all contents of the block are compressed. Subsequently, as more data is added to the block and the threshold is again reached, the entire block is recompressed to achieve the highest level of compression. This process repeats until Oracle determines that the block can no longer benefit from further compression.").

85. Oracle also infringes other claims of the '867 patent, directly and through inducing infringement, for similar reasons as explained above with respect to Claim 16 of the '867 patent.

86. By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentality, and touting the benefits of using the Accused Instrumentality's compression features, Oracle has injured Realtime and is liable to Realtime for infringement of the '867 patent pursuant to 35 U.S.C. § 271.

87. As a result of Oracle's infringement of the '867 patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Oracle's infringement, but in no event less than a reasonable royalty for the use made of the invention by Oracle, together with interest and costs as fixed by the Court.

COUNT V

INFRINGEMENT OF U.S. PATENT NO. 8,502,707

88. Plaintiff realleges and incorporates by reference paragraphs 1-87 above, as if fully set forth herein.

89. Plaintiff Realtime is the owner by assignment of United States Patent No. 8,502,707 ("'707 patent") entitled "Data compression systems and methods." The '707 patent was duly and legally issued by the United States Patent and Trademark Office on

August 6, 2013. A true and correct copy of the '707 Patent is included as Exhibit E.

Hybrid Columnar Compression

90. On information and belief, Oracle has offered for sale, sold and/or imported into the United States Oracle products that infringe the '707 patent, and continues to do so. By way of illustrative example, these infringing products include, without limitation, Oracle's products and services, such as those incorporating, e.g., Hybrid Columnar Compression, and all versions and variations thereof since the issuance of the '707 patent ("Accused Instrumentality").

91. On information and belief, Oracle has directly infringed and continues to infringe the '707 patent, for example, through its own use and testing of the Accused Instrumentality, which constitutes a non-transitory machine-readable storage medium encoded with machine executable instructions for performing the method comprising: associating at least one encoder of a plurality of encoders to each one of a plurality of data types; determining a data type of a data block, wherein said data block is provided as part of a data stream; if said determined data type is associated with at least one of said plurality of encoders, compressing said data block with said at least one associated encoder to provide a compressed data block; determining whether said compressed data block is representative of a data compression ratio above a threshold and, if said determination is above said threshold, outputting said compressed data block; and outputting a descriptor that is indicative of how said compressed data block was compressed. Upon information and belief, Oracle uses the Accused Instrumentality, an infringing non-transitory machine-readable storage medium, 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 Oracle's customers.

92. On information and belief, Oracle has had knowledge of the '707 patent since at least the filing of this Complaint or shortly thereafter, and on information and

belief, Oracle knew of the '707 patent and knew of its infringement, including by way of this lawsuit.

93. Oracle has induced and continues to induce users of the Accused Instrumentality, through its affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentality, to make and/or use the Accused Instrumentality in its normal and customary way to infringe the '707 patent, knowing that when the Accused Instrumentality is made and/or used in its ordinary and customary manner with compatible hardware, the Accused Instrumentality constitutes an infringing non-transitory machine-readable storage medium encoded with machine executable instructions for performing the method comprising: associating at least one encoder of a plurality of encoders to each one of a plurality of data types; determining a data type of a data block, wherein said data block is provided as part of a data stream; if said determined data type is associated with at least one of said plurality of encoders, compressing said data block with said at least one associated encoder to provide a compressed data block; determining whether said compressed data block is representative of a data compression ratio above a threshold and, if said determination is above said threshold, outputting said compressed data block; and outputting a descriptor that is indicative of how said compressed data block was compressed. For example, Oracle explains to customers the benefits of using the Accused Instrumentality, e.g., that use of HCC typically results in 6x to 10x compression ratios when QUERY compression is used, increasing query performance, and 10x to 15x compression ratios when ARCHIVE compression is used. See https://www.oracle.com/us/assets/lad-2015-ses16380-pedregal-2604876.pdf at 11; http://www.oracle.com/technetwork/articles/servers-storage-admin/perf-hybrid-columnar-compression-1689701.html ("Oracle Database-aware technologies have the advantage of compressing the data before it's sent to the storage system, which generally results in the movement of less data and higher performance. Additionally, because the compression is fully integrated with Oracle Database, queries

often can run directly on the compressed data."). Oracle specifically intended and was aware that the normal and customary making and/or use of the Accused Instrumentality would infringe the '707 patent. Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '707 patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Oracle engaged in such inducement to promote the sales of the Accused Instrumentality, *e.g.,* through Oracle's user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '707 patent. Accordingly, Oracle has induced and continues to induce end users of the Accused Instrumentality to make and/or use the Accused Instrumentality in its ordinary and customary way to make and/or use systems infringing the '707 patent, knowing that such making and/or use of the Accused Instrumentality will result in infringement of the '707 patent.

94. Oracle also indirectly infringes the '707 patent by manufacturing, using, selling, offering for sale, and/or importing the Accused Instrumentality, with knowledge that the Accused Instrumentality was and is especially manufactured and/or especially adapted for use in infringing the '707 patent and is 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, including Exadata, to create a non-transitory machine-readable storage medium encoded with machine executable instructions for performing the method comprising: associating at least one encoder of a plurality of encoders to each one of a plurality of data types; determining a data type of a data block, wherein said data block is provided as part of a data stream; if said determined data type is associated with at least one of said plurality of encoders, compressing said data block with said at least one associated encoder to provide a compressed data block; determining whether said compressed data block is representative of a data compression ratio above a threshold and, if said determination is

above said threshold, outputting said compressed data block; and outputting a descriptor that is indicative of how said compressed data block was compressed. Because the Accused Instrumentality is designed to become the claimed non-transitory machine-readable storage medium encoded with machine executable instructions for compressing input data, the Accused Instrumentality has no substantial non-infringing uses, and any other uses would be unusual, far-fetched, illusory, impractical, occasional, aberrant, or experimental. Oracle's manufacture, use, sale, offering for sale, and/or importation of the Accused Instrumentality constitutes contributory infringement of the '707 patent.

95. The Accused Instrumentality is hardware and/or software that when installed on compatible hardware, including but not limited to Exadata, constitutes a non-transitory machine-readable storage medium encoded with machine executable instructions for performing the claimed method. For example, the hard drive of a computer on which the Accused Instrumentality is installed constitutes the claimed non-transitory machine-readable storage medium encoded with machine executable instructions for performing the claimed method.

96. The Accused Instrumentality is encoded with machine executable instructions for associating at least one encoder of a plurality of encoders to each one of a plurality of data types. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression."). For example, the Accused Instrumentality associates at least one encoder (e.g., run-length encoder) to each one of a plurality of data types (e.g., plural consecutive matching types of data).

97. The Accused Instrumentality is encoded with machine executable instructions for determining a data type of a data block, wherein said data block is provided as part of a data stream. See, e.g., https://blogs.oracle.com/smartscan-deep-dive/entry/why_you_don_t_want ("For columnar major compression types (HCC and IMC) Oracle typically offers two rounds of compression."). For example, the Accused

Instrumentality determines a data type of a data block (e.g., plural consecutive matching types of data) that is provided as part of a data stream.

98. The Accused Instrumentality is encoded with machine executable instructions for compressing said data block with said at least one associated encoder to provide a compressed data block if said determined data type is associated with at least one of said plurality of encoders. For example, the Accused Instrumentality compresses the data bocks with an associated encoder (e.g., run-length encoder) to provide a compressed data block if the determined data type (e.g., plural consecutive matching types of data) is associated with the encoder.

99. The Accused Instrumentality is encoded with machine executable instructions for determining whether said compressed data block is representative of a data compression ratio above a threshold and, if said determination is above said threshold, outputting said compressed data block. For example, the Accused Instrumentality determines whether the compressed data block is representative of data compression ratio (e.g., whether compression resulted in sufficient reduction of data), and outputs compressed data block depending on this determination.

100. The Accused Instrumentality is encoded with machine executable instructions for outputting a descriptor that is indicative of how said compressed data block was compressed. For example, the Accused Instrumentality outputs a descriptor that is indicative of compression algorithm (e.g., run-length encoding) used to compress the data.

101. Oracle also infringes other claims of the ‘707 patent, directly and through inducing infringement and contributory infringement, for similar reasons as explained above with respect to Claim 77 of the ‘707 patent.

102. By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentality, and touting the benefits of using the Accused Instrumentality’s compression features, Oracle has injured Realtime and is liable to

Realtime for infringement of the '707 patent pursuant to 35 U.S.C. § 271.

103. As a result of Oracle's infringement of the '707 patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Oracle's infringement, but in no event less than a reasonable royalty for the use made of the invention by Oracle, together with interest and costs as fixed by the Court.

COUNT VI

INFRINGEMENT OF U.S. PATENT NO. 6,748,457

104. Plaintiff realleges and incorporates by reference paragraphs 1-103 above, as if fully set forth herein.

105. Plaintiff Realtime is the owner by assignment of United States Patent No. 6,748,457 ("'457 patent") entitled "Data storewidth accelerator." The '457 patent was duly and legally issued by the United States Patent and Trademark Office on June 8, 2004. A true and correct copy of the '457 Patent is included as Exhibit F.

Oracle SPARC Solaris

106. On information and belief, Oracle has offered for sale, sold and/or imported into the United States Oracle products that infringe the '457 patent, and continues to do so. By way of illustrative example, these infringing products include, without limitation, Oracle's products and services, such as those incorporating, e.g., Oracle SPARC Solaris, and all versions and variations thereof since the issuance of the '457 patent ("Accused Instrumentality").

107. On information and belief, Oracle has directly infringed and continues to infringe the '457 patent, for example, through its sale, offer for sale, and importation of the Accused Instrumentality, as well as through its own use and testing of the Accused Instrumentality, which constitutes an infringing data storage controller for controlling storage and retrieval of data to and from a data storage device, the data storage controller comprising; a digital signal processor (DSP) or processor comprising a data compression

engine (DCE) for compressing data stored to the data storage device and for decompressing data retrieved from the data storage device; a programmable logic device, wherein the programmable logic device is programmed by the DSP or processor to (i) instantiate a first interface for operatively interfacing the data storage controller to the data storage device and to (ii) instantiate a second interface for operatively interfacing the data storage controller to a host system; a non-volatile memory device, for storing logic code associated with the DSP or processor, the first interface and the second interface; a cache memory; and a boot device controller that preloads boot data into the cache memory of the data storage controller prior to commencement of a boot process of the host system, wherein the data storage controller services requests by the host system for the boot data from the cache memory during the boot process of the host system. On information and belief, Oracle uses the Accused Instrumentality in its ordinary and customary fashion 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 Oracle's customers.

108. On information and belief, Oracle has had knowledge of the '457 patent since at least the filing of this Complaint or shortly thereafter, and on information and belief, Oracle knew of the '457 patent and knew of its infringement, including by way of this lawsuit.

109. Oracle's affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentality have induced and continue to induce users of the Accused Instrumentality to use the Accused Instrumentality in its normal and customary way to infringe the '457 patent by using systems claimed by the '457 patent, including a data storage controller for controlling storage and retrieval of data to and from a data storage device, the data storage controller comprising; a digital signal processor (DSP) or processor comprising a data compression engine (DCE) for compressing data stored to the data storage device and for decompressing data retrieved

from the data storage device; a programmable logic device, wherein the programmable logic device is programmed by the DSP or processor to (i) instantiate a first interface for operatively interfacing the data storage controller to the data storage device and to (ii) instantiate a second interface for operatively interfacing the data storage controller to a host system; a non-volatile memory device, for storing logic code associated with the DSP or processor, the first interface and the second interface; a cache memory; and a boot device controller that preloads boot data into the cache memory of the data storage controller prior to commencement of a boot process of the host system, wherein the data storage controller services requests by the host system for the boot data from the cache memory during the boot process of the host system. For example, Oracle explains to customers the benefits of using the Accused Instrumentality: "The boot processes on the Solaris SPARC platform have been redesigned and improved to increase commonality with the Solaris x86 boot experience. The new Solaris SPARC boot design enables the addition of new features, for example new file system types, without necessitating any changes to multiple portions of the boot chain. Changes also include the implementation of boot phase independence. Highlights of these improvements include: • Commonality in boot processes on the Solaris SPARC and x86 platforms • Commonality in the network boot experience • Boot architecture flexibility that enables booting a system from different file system types more easily". See https://docs.oracle.com/cd/E19120-01/open.solaris/819-2379/ggefi/index.html. Oracle specifically intended and was aware that the normal and customary use of the Accused Instrumentality would infringe the '457 patent. Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '457 patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Oracle engaged in such inducement to promote the sales of the Accused Instrumentality, *e.g.,* through Oracle's user manuals, product support, marketing materials, and training materials to

actively induce the users of the Accused Instrumentality to infringe the '457 patent. Accordingly, Oracle has induced and continues to induce users of the Accused Instrumentality to use the Accused Instrumentality in its ordinary and customary way to infringe the '457 patent, knowing that such use constitutes infringement of the '457 patent.

110. The Accused Instrumentality comprises a data storage controller for controlling storage and retrieval of data to and from a data storage device, such as SAS disk drives or NVM Express flash storage connected via PCIe. See, e.g., https://community.oracle.com/servlet/JiveServlet/downloadBody/1000784-102-4-135878/S7_Architecture_WP_20160720.pdf ("The SPARC S7 processor–based servers support both 2.5-inch small form factor (SFF) NVMe SSDs and the Oracle Flash Accelerator F320 PCIe Card … The only exception is the SPARC S7-2L server configuration with the 3.5-inch disk drive cage, which supports only SAS drives. … **PCIe Adapter Cards** SPARC S7-2 and SPARC S7-2L servers feature PCIe 3.0 expansion card slots, which are wired for x8 operation. Select card slots physically support x16 cards, which will operate in up to x8 mode while in these systems. Supported options and requirements vary by server models. At release, available adapter cards from Oracle include the following: » Oracle Storage 12 Gb/s SAS PCIe HBA, external » Oracle's Sun Storage 16 Gb FC PCIe Universal HBA").

111. The Accused Instrumentality comprises a digital signal processor (DSP) or processor comprising a data compression engine (DCE) for compressing data stored to the data storage device and for decompressing data retrieved from the data storage device. See, e.g., https://community.oracle.com/servlet/JiveServlet/downloadBody/1000784-102-4-135878/S7_Architecture_WP_20160720.pdf ("Oracle's SPARC S7 processor is designed for scale-out systems with up to two processor sockets. The processor is optimized to include balanced compute capacity and integrated system functions, which eliminates many separate system components such as memory buffer-on-board chips and

supporting ASICs."); https://docs.oracle.com/cd/E19120-01/open.solaris/819-2379/ggefi/index.html ("The ramdisk extracts the kernel image from the boot archive and then executes it. To minimize the size of the ramdisk, in particular, the installation miniroot that resides in the system's memory, the contents of the miniroot are compressed. This compression is performed on a per-file level and is implemented within the individual file system. The /usr/sbin/fiocompress utility is then used to compress the file and mark the file as compressed. … only SPARC based systems that support the new boot architecture have the ability to pack and unpack a compressed version of the miniroot.").

112. The Accused Instrumentality comprises a programmable logic device, wherein the programmable logic device is programmed by the DSP or processor to (i) instantiate a first interface for operatively interfacing the data storage controller to the data storage device and to (ii) instantiate a second interface for operatively interfacing the data storage controller to a host system. See, e.g., https://community.oracle.com/servlet/JiveServlet/downloadBody/1000784-102-4-135878/S7_Architecture_WP_20160720.pdf ("In addition to the processor cores, the SPARC S7 processor has on-chip DDR4 memory interfaces and a PCIe 3.0 controller. … A PCIe 3.0 root complex is integrated into the processor with a bandwidth of x16 providing connectivity to the I/O devices and networking. … The Oracle Solaris 11.3 release is specifically designed to take full advantage of the SPARC M7 and S7 processor–based servers, including the complete set of advanced Software in Silicon features.").

113. The Accused Instrumentality comprises a non-volatile memory device, for storing logic code associated with the DSP or processor, the first interface and the second interface. See, e.g., https://community.oracle.com/servlet/JiveServlet/downloadBody/1000784-102-4-135878/S7_Architecture_WP_20160720.pdf ("Figure 8 shows a block diagram of the

SPARC S7-2L server with various disk drive cage options. Each SPARC S7 processor connects to eight onboard memory slots. Similar to the SPARC S7-2 server, each SPARC S7 processor provides one PCIe bus (root complex) and connects to both PCIe switches. Each PCIe switch supports device connections for both of the PCIe root complexes. … The internal PCIe slot 7 is occupied either by a SAS HBA or an NVMe PCIe switch card that is installed at the factory.").

114. The Accused Instrumentality comprises a cache memory. See, e.g., https://community.oracle.com/servlet/JiveServlet/downloadBody/1000784-102-4-135878/S7_Architecture_WP_20160720.pdf ("In the SPARC S7 processor, four cores are combined into a core cluster with two core clusters per SPARC S7 processor. Within the SPARC core cluster, each core has its own 16 KB L1 instruction and data cache. Two cores then share a 256 KB L2 data cache with the four cores sharing a 256 KB L2 instruction cache. The L3 cache is fully shared and partitioned. The L3 partition is eight-way set-associative with a 64-byte line size, and is composed of two address-interleaved banks. Any L3 partition may serve a request from any of the eight cores of the SPARC S7 processor. Hot cache lines are migrated to the closest L3 cache partition to optimize performance.").

115. The Accused Instrumentality comprises a boot device controller that preloads boot data into the cache memory of the data storage controller prior to commencement of a boot process of the host system, wherein the data storage controller services requests by the host system for the boot data from the cache memory during the boot process of the host system. See, e.g., https://docs.oracle.com/cd/E19120-01/open.solaris/819-2379/ggefi/index.html ("The ramdisk extracts the kernel image from the boot archive and then executes it. To minimize the size of the ramdisk, in particular, the installation miniroot that resides in the system's memory, the contents of the miniroot are compressed. This compression is performed on a per-file level and is implemented within the individual file system. The /usr/sbin/fiocompress utility is then used to

compress the file and mark the file as compressed. … only SPARC based systems that support the new boot architecture have the ability to pack and unpack a compressed version of the miniroot.").

116. Oracle also infringes other claims of the '457 patent, directly and through inducing infringement, for similar reasons as explained above with respect to Claim 19 of the '457 patent.

117. By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentality, and touting the benefits of using the Accused Instrumentality's compression features, Oracle has injured Realtime and is liable to Realtime for infringement of the '457 patent pursuant to 35 U.S.C. § 271.

118. As a result of Oracle's infringement of the '457 patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Oracle's infringement, but in no event less than a reasonable royalty for the use made of the invention by Oracle, together with interest and costs as fixed by the Court.

COUNT VII

INFRINGEMENT OF U.S. PATENT NO. 8,717,204

119. Plaintiff realleges and incorporates by reference paragraphs 1-118 above, as if fully set forth herein.

120. Plaintiff Realtime is the owner by assignment of United States Patent No. 8,717,204 entitled "Methods for encoding and decoding data." The '204 patent was duly and legally issued by the United States Patent and Trademark Office on May 6, 2014. A true and correct copy of the '204 Patent is included as Exhibit G.

Hybrid Columnar Compression

121. On information and belief, Oracle has offered for sale, sold and/or imported into the United States Oracle products that infringe the '204 patent, and continues to do so. By way of illustrative example, these infringing products include,

without limitation, Oracle's products and services, such as those incorporating, e.g., Hybrid Columnar Compression, and all versions and variations thereof since the issuance of the '204 patent ("Accused Instrumentality").

122. On information and belief, Oracle has directly infringed and continues to infringe the '204 patent, for example, through its own use and testing of the accused products to practice compression methods claimed by the '204 patent, including a method for processing data, the data residing in data fields, comprising: recognizing any characteristic, attribute, or parameter of the data; selecting an encoder associated with the recognized characteristic, attribute, or parameter of the data; compressing the data with the selected encoder utilizing at least one state machine to provide compressed data having a compression ratio of over 4:1; and point-to-point transmitting the compressed data to a client; wherein the compressing and the transmitting occur over a period of time which is less than a time to transmit the data in an uncompressed form. On information and belief, Oracle uses the Accused Instrumentality in its ordinary and customary fashion 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 Oracle's customers, and use of the Accused Instrumentality in its ordinary and customary fashion results in infringement of the methods claimed by the '204 patent.

123. On information and belief, Oracle has had knowledge of the '204 patent since at least the filing of this Complaint or shortly thereafter, and on information and belief, Oracle knew of the '204 patent and knew of its infringement, including by way of this lawsuit.

124. Oracle's affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentality have induced and continue to induce users of the Accused Instrumentality to use the Accused Instrumentality in its normal and customary way to infringe the '204 patent by practicing compression methods claimed by

the '204 patent, including a method for processing data, the data residing in data fields, comprising: recognizing any characteristic, attribute, or parameter of the data; selecting an encoder associated with the recognized characteristic, attribute, or parameter of the data; compressing the data with the selected encoder utilizing at least one state machine to provide compressed data having a compression ratio of over 4:1; and point-to-point transmitting the compressed data to a client; wherein the compressing and the transmitting occur over a period of time which is less than a time to transmit the data in an uncompressed form. For example, Oracle explains to customers the benefits of using the Accused Instrumentality, e.g., that use of HCC typically results in 6x to 10x compression ratios when QUERY compression is used, increasing query performance, and 10x to 15x compression ratios when ARCHIVE compression is used. See https://www.oracle.com/us/assets/lad-2015-ses16380-pedregal-2604876.pdf at 11; http://www.oracle.com/technetwork/articles/servers-storage-admin/perf-hybrid-columnar-compression-1689701.html ("Oracle Database-aware technologies have the advantage of compressing the data before it's sent to the storage system, which generally results in the movement of less data and higher performance. Additionally, because the compression is fully integrated with Oracle Database, queries often can run directly on the compressed data."). Oracle specifically intended and was aware that the normal and customary use of the Accused Instrumentality would infringe the '204 patent. Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '204 patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Oracle engaged in such inducement to promote the sales of the Accused Instrumentality, *e.g.,* through Oracle's user manuals, product support, marketing materials, and training materials to actively induce the users of the Accused Instrumentality to infringe the '204 patent. Accordingly, Oracle has induced and continues to induce users of the Accused Instrumentality to use the Accused

Instrumentality in its ordinary and customary way to infringe the '204 patent, knowing that such use constitutes infringement of the '204 patent.

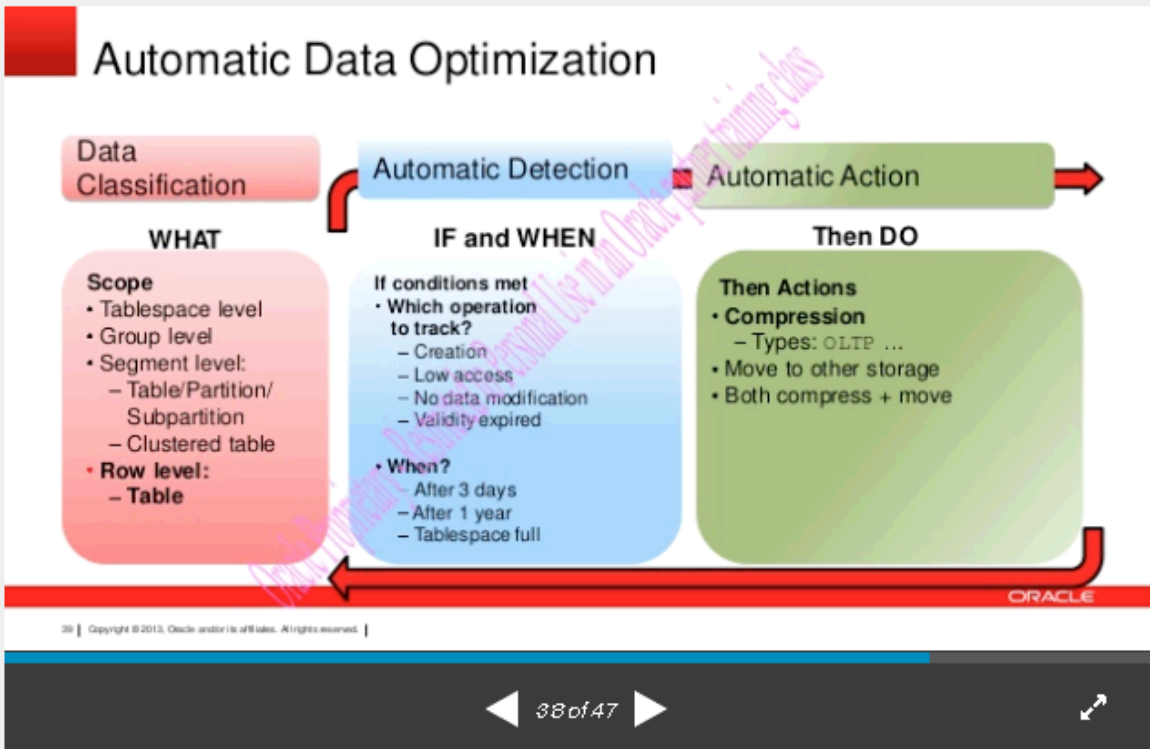
125. The Accused Instrumentality practices a method for processing data, the data residing in data fields. See, e.g., http://www.oracle.com/technetwork/database/database-technologies/hybrid-col-compression/overview/hccoverviewpage-2403631.html ("Oracle's Hybrid Columnar Compression (HCC) technology is a new method for organizing data within a database block. As the name implies, this technology utilizes a combination of both row and columnar methods for storing data. This hybrid approach achieves the compression benefits of columnar storage, while avoiding the performance shortfalls of a pure columnar format. Traditionally, data has been organized within a database block in a 'row' format, where all column data for a particular row is stored sequentially within a single database block. Having data from columns with different data types stored close together limits the amount of storage savings achievable with compression technology. An alternative approach is to store data in a 'columnar' format, where data is organized and stored by column.").

126. The Accused Instrumentality recognizes any characteristic, attribute, or parameter of the data. See, e.g., http://www.oracle.com/technetwork/database/automatic-data-optimization-wp-12c-1896120.pdf at 9 ("Oracle Database will automatically evaluate the ADO policies to determine if the partition is eligible to be moved to a higher compression level, and if the partition is eligible to be moved to a lower cost storage tier.").

127. The Accused Instrumentality selects an encoder associated with the recognized characteristic, attribute, or parameter of the data, for example, how frequently the data is modified or queried. See, e.g., http://www.oracle.com/technetwork/database/automatic-data-optimization-wp-12c-1896120.pdf at 3 ("In Oracle Database 12c, two ILM features are included with the

Advanced Compression option. Heat Map automatically tracks modification and query timestamps at the row and segment levels, providing detailed insights into how data is being accessed. Automatic Data Optimization (ADO) automatically moves and compresses data according to user-defined policies based on the information collected by Heat Map.").

128. The Accused Instrumentality compresses the data with the selected encoder utilizing at least one state machine to provide compressed data having a compression ratio of over 4:1. See, e.g., http://www.oracle.com/technetwork/database/automatic-data-optimization-wp-12c-1896120.pdf at 3 ("Automatic Data Optimization (ADO) automatically moves and compresses data according to user-defined policies based on the information collected by Heat Map."); http://www.slideshare.net/oracle_imc_team/partner-db12c-eseminar:



http://www.oracle.com/technetwork/articles/servers-storage-admin/perf-hybrid-columnar-compression-1689701.html:

COMPRESSION TYPE	SIZE	SPACE SAVINGS

No compression	735 GB	NA
OLTP Table Compression (Advanced Compression Option)	243 GB	3.0x
Hybrid Columnar Compression	38 GB	19.3x
Sun ZFS Storage Appliance LZJB compression	143 GB	5.1x
LZJB plus Advanced Compression Option	131 GB	5.6x

Database-aware compression technologies, such as Advanced Compression Option and Hybrid Columnar Compression, allow the data to be transferred between the storage and server in the native compressed format. The data remains compressed not only on disk, but it also remains compressed in the Database Smart Flash Cache, on the network, in the database server buffer cache, as well as during Oracle Recovery Manager (Oracle RMAN) backups or log shipping with Oracle Active Data Guard.").

129. The Accused Instrumentality point-to-point transmits the compressed data to a client. See, e.g., http://www.oracle.com/technetwork/articles/servers-storage-admin/perf-hybrid-columnar-compression-1689701.html ("To evaluate the effect that Hybrid Columnar Compression had on query performance, we built two different environments. A NAS environment was set up, and the storage was connected to the server via Direct NFS Client."); http://www.oracle.com/technetwork/articles/servers-storage-admin/perf-hybrid-columnar-compression-1689701.html ("Database-aware compression technologies, such as Advanced Compression Option and Hybrid Columnar Compression, allow the data to be transferred between the storage and server in the native compressed format. The data remains compressed not only on disk, but it also remains compressed in the Database Smart Flash Cache, on the network, in the database server buffer cache, as well as during Oracle Recovery Manager (Oracle RMAN) backups or log shipping with Oracle Active Data Guard.").

130. In the Accused Instrumentality, the compressing and the transmitting occur over a period of time which is less than a time to transmit the data in an uncompressed form. See, e.g., https://blogs.oracle.com/emeapartnerhardware/entry/optimized_storage_for_db_workload

s1 ("In the case of database tables stored in a ZFS Storage Appliance and HCC compressed, all the queries to the disk subsystem are returned in the HCC compressed format, resulting in a much faster transmission of the data and greatly improved query performances.").

131. Oracle also infringes other claims of the '204 patent, directly and through inducing infringement, for similar reasons as explained above with respect to Claim 1 of the '204 patent.

132. By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentality, and touting the benefits of using the Accused Instrumentality's compression features, Oracle has injured Realtime and is liable to Realtime for infringement of the '204 patent pursuant to 35 U.S.C. § 271.

133. As a result of Oracle's infringement of the '204 patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Oracle's infringement, but in no event less than a reasonable royalty for the use made of the invention by Oracle, together with interest and costs as fixed by the Court.

COUNT VIII

INFRINGEMENT OF U.S. PATENT NO. 7,376,772

134. Plaintiff realleges and incorporates by reference paragraphs 1-133 above, as if fully set forth herein.

135. Plaintiff Realtime is the owner by assignment of United States Patent No. 7,376,772 ("'772 patent") entitled "Data storewidth accelerator." The '772 patent was duly and legally issued by the United States Patent and Trademark Office on May 20, 2008. A true and correct copy of the '457 Patent is included as Exhibit H.

Oracle ZFS Storage Appliance

136. On information and belief, Oracle has offered for sale, sold and/or imported into the United States Oracle products that infringe the '772 patent, and

continues to do so. By way of illustrative example, these infringing products include, without limitation, Oracle's products and services, such as Oracle ZFS Storage Appliance, and all versions and variations thereof since the issuance of the '772 patent ("Accused Instrumentality").

137. On information and belief, Oracle has directly infringed and continues to infringe the '772 patent, for example, through its sale, offer for sale, and importation of the Accused Instrumentality, as well as through its own use and testing of the Accused Instrumentality, which constitutes an infringing system comprising: a processor comprising a data compression engine for compressing data stored to a data storage device and for decompressing data retrieved from the data storage device; a programmable logic device, wherein the programmable logic device is programmed by the processor to instantiate a first interface for operatively interfacing the data storage controller to the data storage device and to instantiate a second interface for operatively interfacing the data storage controller to a host system; a non-volatile memory device, for storing logic code associated with the processor, the first interface and the second interface; and a cache memory device for temporarily storing data that is processed by or transmitted through the data storage controller; wherein the processor further comprises a bandwidth allocation controller for controlling access to the cache memory device by the data compression engine, the first interface and the second interface. On information and belief, Oracle uses the Accused Instrumentality in its ordinary and customary fashion 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 Oracle's customers.

138. On information and belief, Oracle has had knowledge of the '772 patent since at least the filing of this Complaint or shortly thereafter, and on information and belief, Oracle knew of the '772 patent and knew of its infringement, including by way of this lawsuit.

139. Oracle's affirmative acts of making, using, selling, offering for sale, and/or importing the Accused Instrumentality have induced and continue to induce users of the Accused Instrumentality to use the Accused Instrumentality in its normal and customary way to infringe the '457 patent by using systems claimed by the '457 patent, including a system comprising: a processor comprising a data compression engine for compressing data stored to a data storage device and for decompressing data retrieved from the data storage device; a programmable logic device, wherein the programmable logic device is programmed by the processor to instantiate a first interface for operatively interfacing the data storage controller to the data storage device and to instantiate a second interface for operatively interfacing the data storage controller to a host system; a non-volatile memory device, for storing logic code associated with the processor, the first interface and the second interface; and a cache memory device for temporarily storing data that is processed by or transmitted through the data storage controller; wherein the processor further comprises a bandwidth allocation controller for controlling access to the cache memory device by the data compression engine, the first interface and the second interface. For example, Oracle explains to users the benefits of using the Accused Instrumentality. See, e.g., http://www.oracle.com/technetwork/server-storage/sun-unified-storage/documentation/o14-001-architecture-overview-zfsa-2099942.pdf at 3 ("To deliver high performance and advanced data services, the Oracle ZFS Storage Appliance uses a combination of standard enterprise-grade hardware and a unique, storage-optimized operating system based on the Oracle Solaris kernel with Oracle's ZFS file system at its core. The storage controllers are based upon powerful Oracle x86 Servers that can deliver the exceptional compute power required to concurrently run multiple modern storage workloads along with advanced data services. … The controller then handles the computations required to implement the selected data protection (i.e. mirroring, RAIDZ), data reduction (i.e. inline compression, deduplication), and any other relevant data services (i.e. remote replication)."). Oracle specifically intended and was

aware that the normal and customary use of the Accused Instrumentality would infringe the '772 patent. Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '772 patent and with the knowledge, or willful blindness to the probability, that the induced acts would constitute infringement. On information and belief, Oracle engaged in such inducement to promote the sales of the Accused Instrumentality, *e.g.,* through Oracle's user manuals, product support, marketing materials, and training materials to actively induce the users of the Accused Instrumentality to infringe the '772 patent. Accordingly, Oracle has induced and continues to induce users of the Accused Instrumentality to use the Accused Instrumentality in its ordinary and customary way to infringe the '772 patent, knowing that such use constitutes infringement of the '772 patent.

140. The Accused Instrumentality is system comprising: a processor comprising a data compression engine for compressing data stored to a data storage device and for decompressing data retrieved from the data storage device. See, e.g., http://www.oracle.com/technetwork/server-storage/sun-unified-storage/documentation/o14-001-architecture-overview-zfsa-2099942.pdf at 3 ("To deliver high performance and advanced data services, the Oracle ZFS Storage Appliance uses a combination of standard enterprise-grade hardware and a unique, storage-optimized operating system based on the Oracle Solaris kernel with Oracle's ZFS file system at its core. The storage controllers are based upon powerful Oracle x86 Servers that can deliver the exceptional compute power required to concurrently run multiple modern storage workloads along with advanced data services. … The controller then handles the computations required to implement the selected data protection (i.e. mirroring, RAIDZ), data reduction (i.e. inline compression, deduplication), and any other relevant data services (i.e. remote replication).").

141. The Accused Instrumentality comprises a programmable logic device, wherein the programmable logic device is programmed by the processor to instantiate a

first interface for operatively interfacing the data storage controller to the data storage device. See, e.g., https://docs.oracle.com/cd/E40985_01/html/E40987/z4000e361028737.html# ("Look for the revision number that appears after the Firmware revision string. If more than one IB-HCA device is displayed, look for the Node Image GUID that matches the GUID displayed on the physical GUID label of the adapter being installed. See Node GUID. If the firmware version is not at 2.11.1280 or higher, you must update the firmware. Only update the firmware on your adapter with files specifically approved for the product. … Use the fwflash command to install the firmware. # fwflash -d device-path-of-IB-adapter -f firmware-image-file").

142. The Accused Instrumentality instantiates a second interface for operatively interfacing the data storage controller to a host system. See, e.g., http://www.oracle.com/technetwork/server-storage/sun-unified-storage/documentation/o14-001-architecture-overview-zfsa-2099942.pdf at 3 ("The controller then handles the computations required to implement the selected data protection (i.e. mirroring, RAIDZ), data reduction (i.e. inline compression, deduplication), and any other relevant data services (i.e. remote replication).").

143. The Accused Instrumentality comprises a non-volatile memory device, for storing logic code associated with the processor, the first interface and the second interface. See, e.g., https://docs.oracle.com/cd/E40985_01/html/E40987/z4000e361028737.html# ("Look for the revision number that appears after the Firmware revision string. If more than one IB-HCA device is displayed, look for the Node Image GUID that matches the GUID displayed on the physical GUID label of the adapter being installed. See Node GUID. If the firmware version is not at 2.11.1280 or higher, you must update the firmware. Only update the firmware on your adapter with files specifically approved for the product. … Use the fwflash command to install the firmware. # fwflash -d device-path-of-IB-adapter

-f firmware-image-file").

144. The Accused Instrumentality comprises a cache memory device for temporarily storing data that is processed by or transmitted through the data storage controller. See, e.g., http://www.oracle.com/technetwork/server-storage/sun-unified-storage/documentation/o14-001-architecture-overview-zfsa-2099942.pdf ("The controllers also handle the caching of stored data in both DRAM and flash. Our unique caching algorithm is key to the spectacular performance that can be obtained from an Oracle ZFS Storage Appliance.")

145. In the Accused Instrumentality, the processor further comprises a bandwidth allocation controller for controlling access to the cache memory device by the data compression engine, the first interface and the second interface. See, e.g., http://www.oracle.com/technetwork/server-storage/sun-unified-storage/documentation/zfssa-replication-2014-1-2120969.pdf ("The dynamic compression selection algorithm chooses between the use of GZIP and LZJB. GZIP compression offers a higher compression rate but needs more CPU resources than LZJB type of compression. The selection algorithm uses available CPU resources and replication link speed as selection criteria to dynamically switch between use of GZIP or LZJB compression. When using GZIP, data buffers can be compressed fast enough to keep up with a 1 Gbs network. For high-speed network links, LZJB proves to be more efficient.").

146. Oracle also infringes other claims of the '772 patent, directly and through inducing infringement, for similar reasons as explained above with respect to Claim 1 of the '772 patent.

147. By making, using, offering for sale, selling and/or importing into the United States the Accused Instrumentality, and touting the benefits of using the Accused Instrumentality's compression features, Oracle has injured Realtime and is liable to Realtime for infringement of the '772 patent pursuant to 35 U.S.C. § 271.

148. As a result of Oracle's infringement of the '772 patent, Plaintiff Realtime is entitled to monetary damages in an amount adequate to compensate for Oracle's infringement, but in no event less than a reasonable royalty for the use made of the invention by Oracle, 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 Oracle has infringed, either literally and/or under the doctrine of equivalents, the '812 patent, the '728 patent, the '513 patent, the '867 patent, the '707 patent, the '457 patent, the '204 patent, and the '772 patent;

b. A permanent injunction prohibiting Oracle from further acts of infringement of the '812 patent, the '728 patent, the '513 patent, the '867 patent, the '707 patent, the '457 patent, the '204 patent, and the '772 patent;

c. A judgment and order requiring Oracle to pay Plaintiff its damages, costs, expenses, and prejudgment and post-judgment interest for its infringement of the '812 patent, the '728 patent, the '513 patent, the '867 patent, the '707 patent, the '457 patent, the '204 patent, and the '772 patent; and

d. A judgment and order requiring Oracle 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.

DEMAND FOR JURY TRIAL

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

Dated: January 23, 2017

Respectfully submitted,

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