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

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| **OPTIMORPHIX, INC.,** | **Civil Action No._____** |
| *Plaintiff,* | |
| v. | **JURY TRIAL DEMANDED** |
| **ORACLE CORPORATION,** | |
| *Defendant.* | |

## COMPLAINT FOR PATENT INFRINGEMENT

OptiMorphix, Inc. ("OptiMorphix" or "Plaintiff") brings this action and makes the following allegations of patent infringement relating to U.S. Patent Nos.: 7,031,314 (the "'314 patent"); 7,099,273 (the "'273 patent"); 7,444,418 (the "'418 patent"); 7,586,871 (the "'871 patent"); 8,429,169 (the "'169 patent"); 8,521,901 (the "'901 patent"); 9,167,021 (the "'021 patent"); and 9,191,664 (the "'664 patent") (collectively, the "patents-in-suit"). Defendant Oracle Corporation ("Oracle" or "Defendant") infringes the patents-in-suit in violation of the patent laws of the United States of America, 35 U.S.C. § 1 *et seq*.

## THE PARTIES

1. Plaintiff OptiMorphix, Inc. ("Plaintiff" or "OptiMorphix") is a Delaware corporation that holds a portfolio of over 250 patent assets that were developed at Citrix Systems, Inc. ("Citrix") and Bytemobile, Inc.

2. Bytemobile, Inc. ("Bytemobile") was a global leader in mobile internet solutions for network operators. The company was founded in 2000. Bytemobile's mission was to optimize video and web content services for mobile network operators to improve users' experiences while maximizing the efficiency of network infrastructure.

3.     Bytemobile was established during a time when the mobile landscape was evolving

rapidly.  The advent of 3G technology, coupled with increasingly sophisticated smartphones, led

to a surge in demand for data services.  However, mobile networks at the time were not optimized

to handle this influx, particularly for data-rich services like video streaming.  Recognizing this

opportunity, Bytemobile sought to create solutions that would enable network operators to deliver

high-quality, consistent mobile data services.  By 2011, Bytemobile was a "market leader in video

and web optimization, with more than 125 cumulative operator deployments in 60 countries.[1]



Andrew Zipern, *Vodafone in Deal with Start-Up Bytemobile,* NYTimes at C4 (January 29, 2002)
("Bytemobile, a wireless data start-up . . . reached a deal with Vodafone, Britain's largest mobile
phone operator"); *NTT DoCoMo Launches Bytemobile Optimization Solution in its Core Network,*
WIRELESSWATCH IP (October 5, 2004) ("NTT DoCoMo has deployed Bytemobile's optimization
solution in its core network"); *China Mobile Selects Bytemobile for Nationwide Web Gateway
Project*, BUSINESS WIRE (July 8, 2009) ("A Bytemobile customer since 2004, CMCC has deployed
its web optimization solutions"); *Bytemobile Juices Up Orange*, ESPICOM TELECOMMUNICATION
NEWS (October 10, 2002) ("Orange customers will experience faster application performance and
Web page downloads"); *ByteMobile Wins 2013 LTE Award for Best LTE Traffic Management
Product*, MARKETSCREENER (July 1, 2013) ("ByteMobile technology has been deployed . . . in
networks serving nearly two billion subscribers.").

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[1] *Bytemobile: Importance of Video and Web Optimizations*, TELECOM REVIEW at 58 (2011); *see
also Bytemobile Secures Its 36th Video Optimisation Win for MNO Deployment,* TOTAL TELECOM
& TOTAL TELECOM MAGAZINE (March 21, 2011).

4.      Bytemobile products, such as the Unison platform and the T3100 Adaptive Traffic Manager, were designed to optimize mobile data traffic in real-time, ensuring a high-quality mobile internet experience for end-users.  This approach was groundbreaking at the time and set the stage for many of the mobile data optimization techniques used today.

5.      Bytemobile's innovative technologies and customer-centric approach led to rapid growth and success.  Bytemobile's innovative product portfolio included: the T3100 Adaptive Traffic Manager which was designed to handle high volumes of traffic efficiently and provide real-time optimization, compression, and management of mobile data; Bytemobile's T2000 Series Video Cache, which supported transparent caching of content; and Bytemobile's T1000 Series Traffic Director, which enabled traffic steering and load balancing for high availability of applications.



*Bytemobile Adaptive Traffic Management Product Family*, BYTEMOBILE DATA SHEET at 1-2 (2014).

6.      Bytemobile's groundbreaking technologies also included products for data optimization. Bytemobile's data optimization solutions were designed to compress and accelerate data transfer. By reducing the size of data packets without compromising quality, these technologies allowed faster data transmission and minimized network congestion. Bytemobile also offered solutions to analyze and manage network traffic, allowing network operators to identify patterns, allocate bandwidth intelligently, and prioritize different types of content.
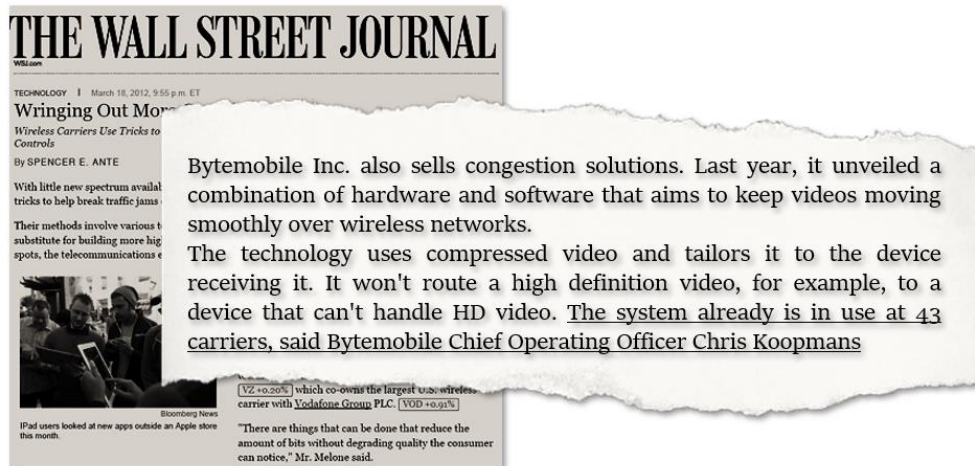


Spencer E. Ante, *Wringing Out More Capacity*, WALL STREET JOURNAL at B3 (March 19, 2012) (emphasis added).

7.      In July 2012, Bytemobile was acquired by Citrix Systems, Inc. ("Citrix") for $435 million. Bytemobile "became part of [Citrix's] Enterprise division and extend[ed] [Citrix's] industry reach into the mobile and cloud markets."[2]

8.      OptiMorphix owns a portfolio of patents developed at Bytemobile and later Citrix. Highlighting the importance of the patents-in-suit is the fact that the OptiMorphix's patent portfolio has been cited by over 4,800 U.S. and international patents and patent applications assigned to a wide variety of the largest companies operating in the networking, content delivery, and cloud computing fields. OptiMorphix's patents have been cited by companies such as:

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[2] CITRIX SYSTEMS, INC. 2012 ANNUAL REPORT at 33 (2013).

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- Amazon.com, Inc. (263 citing patents and applications)[3]
- *Oracle* (59 citing patents and applications)[4]
- Alphabet, Inc. (103 citing patents and applications)[5]
- Broadcom Ltd. (93 citing patents and applications)[6]
- Cisco Systems, Inc. (277 citing patents and applications)[7]
- Lumen Technologies, Inc. (77 citing patents and applications)[8]
- Intel Corporation (45 citing patents and applications)[9]
- Microsoft Corporation (150 citing patents and applications)[10]
- AT&T, Inc. (93 citing patents and applications)[11]
- Verizon Communications, Inc. (31 citing patents and applications)[12]
- Juniper Networks, Inc. (29 citing patents and applications)[13]

9.      Defendant Oracle Corporation ("Oracle") is a corporation organized and existing under the laws of the State of Delaware. Oracle's principal place of business is at 2300 Oracle Way, Austin, Texas 78741.  Oracle may be served through its registered agent The Corporation Trust Company, Corporation Trust Center 1209 Orange St., Wilmington, Delaware 19801.

10.     Oracle conducts business operations within the State of Delaware where it sells, develops, and/or markets its products.  On information and belief, Defendant has used, sold, or offered to sell products and services, including the Accused Products defined herein, in the State of Delaware.

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[3] *See e.g.*, U.S. Patent Nos. 7,817,563; 9,384,204; 9,462,019; 11,343,551; and 11,394,620.
[4] *See e.g.*, U.S. Patent Nos. 7,475,402; 7,574,710; 8,589,610; 8,635,185; and 11,200,240.
[5] *See e.g.*, U.S. Patent Nos. 7,743,003; 8,458,327; 9,166,864; 9,665,617; and 10,733,376.
[6] *See e.g.*, U.S. Patent Nos. 7,636,323; 8,448,214; 9,083,986; 9,357,269; and 10,091,528.
[7] *See e.g.*, U.S. Patent Nos. 7,656,800; 7,930,734; 8,339,954; 9,350,822; and 10,284,484.
[8] *See e.g.*, U.S. Patent Nos. 7,519,353; 8,315,179; 8,989,002; 10,511,533; and 11,233,740.
[9] *See e.g.*, U.S. Patent Nos. 7,394,809; 7,408,932; 9,515,942; 9,923,821; and 10,644,961.
[10] *See e.g.*, U.S. Patent Nos. 8,248,944; 9,071,841; 9,852,118; 10,452,748; and 11,055,47.
[11] *See e.g.*, U.S. Patent Nos. 8,065,374; 8,429,302; 9,558,293; 9,800,638; and 10,491,645.
[12] *See e.g.*, U.S. Patent Nos. 8,149,706; 8,930,559; 9,253,231; 10,003,697; and 10,193,942.
[13] *See e.g.*, U.S. Patent Nos. 8,112,800; 8,509,071; 8,948,174; 9,407,726; and 11,228,631.

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## JURISDICTION AND VENUE

11.     This action arises under the patent laws of the United States, Title 35 of the United States Code.  Accordingly, this Court has exclusive subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a).

12.     This Court has personal jurisdiction over Oracle in this action because Oracle has committed acts within the District of Delaware giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Oracle would not offend traditional notions of fair play and substantial justice.  Oracle, directly and/or 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 patents-in-suit.  Moreover, Oracle is registered to do business in the State of Delaware and actively directs its activities to customers located in the State of Delaware.

13.     Venue is proper in this District under 28 U.S.C. §§ 1391(b)-(d) and 1400(b).  Oracle is organized under the laws of the State of Delaware.

14.     This Court has personal jurisdiction over Oracle because it is organized under the laws of the State of Delaware and maintains a registered agent in Delaware.

## THE ASSERTED PATENTS

### U.S. PATENT NO. 7,031,314

15.     U.S. Patent No. 7,031,314 (the "'314 patent") entitled, *Systems and Methods for Providing Differentiated Services Within a Network Communication System*, was filed on April 19, 2002.  The '314 patent claims priority to U.S. Provisional Patent Application No. 60/291,918, which was filed on May 16, 2001, and U.S. Provisional Patent Application No. 60/309,213 filed

on July 31, 2001.  The '314 patent is subject to a 35 U.S.C. § 154(b) term extension of 625 days. A true and correct copy of the '314 patent is attached hereto as Exhibit 1.

16.    The '314 patent has been in full force and effect since its issuance.  OptiMorphix, Inc. owns by assignment the entire right, title, and interest in and to the '314 patent.

17.    The '314 patent is directed to solving the problem of deploying differentiated services within existing network infrastructure.  The patent identifies that existing network infrastructure was generally not designed to support a wide variety of application-specific and subscriber-specific services as the corresponding data flowed through a network.  "Consequently, the different and potentially incompatible requirements of the increasingly diverse applications, Subscribers and networking environments has placed demands on the existing network infrastructure for which the network infrastructure was not originally designed to handle."  '314 patent, col. 1:37-42.

18.    The '314 patent addresses the issue of identifying the data streams on which to perform the differentiated services, which may involve a significant processing penalty.  "The problem with deploying these differentiated services within the existing network infrastructure is that the network infrastructure was not designed to support a wide variety application-specific and subscriber specific services as the corresponding data flows through the network."  '314 patent, col. 1:47-52.

19.    The inventions disclosed in the '314 patent provide significant benefits and improvements to the function of the hardware in a computer network by enabling differentiated services within the network infrastructure.  By incorporating a service module within the network infrastructure that can intercept packets, determine whether the connection corresponds to a service

application, and then break and reestablish the connection for application-specific processing, the

invention allows for a more efficient and flexible network communication system.

20.     The inventions taught by the '314 patent solves discrete, technological problems

associated with computer systems, specifically those related to network communication systems.

The patent addresses the limitations of existing network infrastructures that were not designed to

support a wide variety of application-specific and subscriber-specific services as data flows

through the network.  It also solves the problem of the significant processing penalty associated

with identifying the data streams on which to perform the differentiated services.

21.     The '314 patent family has been cited by 1,466 United States and international

patents and patent applications as relevant prior art.  Specifically, 141 United States and

international patents and patent applications have cited the '314 patent itself as relevant prior art.

The following companies and research institutions have cited the '314 patent as relevant prior art:

- Cisco Technology, Inc.
- Alphabet Inc.
- ***Oracle Corporation***
- International Business Machines Corp.
- Microsoft Corporation
- Qualcomm, Inc.
- Telefonaktiebolaget Lm Ericsson
- Intel Corporation
- Check Point Software Technologies Ltd.
- Hitachi, Ltd.
- Open Text Corporation
- Fujitsu Limited
- Broadcom Limited
- Samsung Electronics Co., Ltd.

**U.S. PATENT NO. 7,099,273**

22.     U.S. Patent No. 7,099,273 (the "'273 patent") entitled, *Data Transport*

*Acceleration and Management Within a Network Communication System*, was filed on January

29, 2002.  The '273 patent is subject to a 35 U.S.C. § 154(b) term extension of 1,021 days.  The

'273 patent claims priority to U.S. Provisional Patent Application No. 60/309,212 filed on July 31,

2001, and U.S. Provisional Patent Application No. 60/283,542 filed on April 12, 2001.  A true and

correct copy of the '273 patent is attached hereto as Exhibit 2.

23.     The '273 patent has been in full force and effect since its issuance.  OptiMorphix,

Inc. owns by assignment the entire right, title, and interest in and to the '273 patent.

24.     The technologies disclosed in the '273 patent improve the efficiency and speed of

data transmission within network communication systems.  The '273 patent introduces methods

and apparatuses that enhance data transport, especially in environments where network conditions

are variable or unpredictable and "provide systems and method for data transport acceleration and

management within a network communication system." '273 patent, col. 3:31-33.

25.     The '273 patent is directed to solving the problem of inefficient data transport

within network communication systems.  This inefficiency can lead to poor utilization of network

resources, increased latency, and reduced overall performance.

26.     The '273 patent identifies the shortcomings of the prior art.  Specifically, the

specification describes that traditional methods of data transport in network communication

systems often fail to efficiently manage and accelerate data transport, especially in environments

with variable or unpredictable network conditions.  These methods may not adequately handle

network congestion, leading to poor utilization of network resources, increased latency, and

reduced overall performance.  "This bursty nature of data transmission may under-utilize the

available bandwidth on the downlink channel, and may cause some applications requiring a steady

flow of data, such as audio or video, to experience unusually poor performance."  '273 patent, col.

2:1-6.

27.     The '273 patent identifies several shortcomings of the prior art, particularly in the context of the Transport Control Protocol (TCP) which is commonly used in modern data communication networks.  The patent specification describes that:

> Many of the problems associated with conventional TCP architectures stem from the flow control, congestion control and error recovery mechanisms used to control transmission of data over a communication network.

'273 patent, col. 1:38-41.

28.     Conventional TCP architectures assume that the network employs symmetric communication channels that enable data packets and acknowledgements to be equally spaced in time.  This assumption often does not hold true in networks that employ asymmetric uplink and downlink channels, such as wireless communication networks.  Bursty data transmission might result in the inefficient use of the available bandwidth on the downlink channel, leading to suboptimal performance in applications that need a consistent data flow, such as those involving audio or video.

29.     Another shortcoming identified is that conventional TCP architectures react to both random loss and network congestion by significantly and repeatedly reducing the congestion window, which can lead to significant and potentially unjustified deterioration in data throughput.  This is particularly problematic in wireless and other bandwidth constrained networks where random packet loss due to fading, temporary degradation in signal quality, signal handoffs or large propagation delays occur with relatively high frequency.

30.     The '273 patent also points out that conventional TCP congestion control mechanisms tend to exhibit sub-optimal performance during initialization of data connections over reduced-bandwidth channels, such as wireless links.  When a connection is initiated, the congestion control mechanism aggressively increases the size of the congestion window until it senses a data packet loss.  This process may adversely impact other connections that share the

same reduced-bandwidth channel as the connection being initialized attempts to maximize its data throughput without regard of the other pre-existing connections.  This can lead to inefficient use of resources with decreased overall throughput.

31.     The '273 patent teaches the use of various techniques to accelerate and manage data transport in network communication systems.  These techniques include the use of congestion control mechanisms, timers, and other methods to optimize data transmission.  By implementing these techniques, the patent aims to improve the efficiency of data transport, particularly in environments with variable or unpredictable network conditions.  This can lead to better utilization of network resources, reduced latency, and improved overall performance.  The inventions disclosed in the '273 patent provide significant benefits and improvements to the function of the hardware in a computer network.

32.     The '273 patent family has been cited by 1,466 United States and international patents and patent applications as relevant prior art.  Specifically, patents issued to the following companies and research institutions have cited the '273 patent family as relevant prior art:

- Cisco Technology, Inc.
- Qualcomm Incorporated
- International Business Machines Corporation
- Intel Corporation
- Microsoft Corporation
- Broadcom Corporation
- Google Inc.
- F5 Networks, Inc.
- Adobe Systems Incorporated
- Apple Inc.
- Lumen Technologies, Inc
- ***Oracle Corporation***
- Amazon.com, Inc.

**U.S. PATENT NO. 7,444,418**

33.     U.S. Patent No. 7,444,418 (the "'418 patent") entitled, *Transcoding Multimedia Information Within a Network Communication System*, was filed on May 9, 2002.  The '418 patent claims priority to Provisional Application No. 60/290,269, which was filed on May 11, 2001.  The '418 patent is subject to a 35 U.S.C. § 154(b) term extension of 766 days.  A true and correct copy of the '418 patent is attached hereto as Exhibit 3.

34.     The '418 patent has been in full force and effect since its issuance.  OptiMorphix, Inc. owns by assignment the entire right, title, and interest in and to the '418 patent.

35.     The '418 patent describes a method for transcoding multimedia information, which involves intercepting the multimedia data transmitted between a sender and a receiver.  This data can include audio data.  "Embodiments of the present invention alleviate many of the foregoing problems by providing systems and methods for transcoding multimedia information within a network communications system."  '418 patent, col. 2:45-48.

36.     The '418 patent is directed to solving the problem of transmitting information over network communication systems, particularly in scenarios where the transmission rate at which the multimedia information is encoded is greater than the available transmission rate.  "As a result, these bandwidth constrained networks are susceptible to a mismatch between the required transmission rate of the multimedia information and the available transmission rate of the communication channel."  '418 patent, col. 1:56-60.  This problem is especially pronounced in wireless and other bandwidth-constrained networks, which have physical limitations on the maximum bandwidth that the communication channel can support.

37.     The inventions disclosed in the '418 patent provide significant benefits and improvements to the function of the hardware in a computer network by enabling more efficient transmission of media information.  By transcoding the media information to match the available

transmission rate of the downlink channel, the '418 patent teaches methods that prevent the receiver from being overloaded with data transmitted at a rate higher than it can handle. This can help to prevent disruptions and degradation in the performance of media applications, leading to a better functioning of computer hardware.

38.    The '418 patent family has been cited by 166 United States and international patents and patent applications as relevant prior art.    Specifically, patents issued to the following companies and research institutions have cited the '418 patent family as relevant prior art:

- Apple, Inc.
- Verizon Communications Inc.
- Siemens Ag
- Microsoft Corporation
- Cisco Systems, Inc.
- Alphabet Inc.
- Amazon.com, Inc.
- Broadcom Limited
- Qualcomm, Inc.
- Koninklijke Philips Nv

**U.S. PATENT NO. 7,586,871**

39.    U.S. Patent No. 7,586,871 (the "'871 patent") entitled, *Platform and Method for Providing Data Services in a Communication Network*, was filed on January 11, 2006. The '871 patent claims priority to U.S. Application Ser. No. 10/061,953, which was filed on February 2, 2002, which claims the benefit of U.S. Provisional Applications No. 60/292,564, which was filed on May 22, 2001, and No. 60/293,756, which was filed on May 25, 2001. The '871 patent also claims the benefit of U.S. Provisional Application No. 60/654,730, which was filed on February 18, 2005. The '871 patent is subject to a 35 U.S.C. § 154(b) term extension of 748 days. A true and correct copy of the '871 patent is attached hereto as Exhibit 4.

40.    The '871 patent has been in full force and effect since its issuance. OptiMorphix, Inc. owns by assignment the entire right, title, and interest in and to the '871 patent.

41.     The '871 patent generally relates to a communication node and corresponding method for processing data communications passing through the node between a first data network and a second data network.   The method includes detecting an event associated with data communication arriving at the node from the first data network, determining whether the data communication is to be suspended for service at the node based on the detected event, and processing suspended data communication based on information in the data communication.   The patent also covers the detection of return data communication arriving at the node from the second data network in response to the processed data communication from the first data network.   The detected return data communication is allowed to pass through the node without processing the detected return data communication.

42.     The '871 patent is directed to solving the problem of efficiently providing data services, such as content filtering, in a communication network.   This includes the ability to determine whether a packet flow should be suspended for filtering a content request based on packet flow characteristics detected at the layers implemented in hardware, without the need for assistance from higher layers in the architecture implemented in software.

43.     The '871 patent teaches the use of a communication node that processes data communication between two networks.   This node detects an event associated with data communication from the first network, determines whether the data communication should be suspended for service at the node based on the detected event, and processes suspended data communication based on information in the data communication.  The '871 patent also teaches the detection of return data communication from the second network in response to the processed data communication from the first network, allowing this return data communication to pass through the node without further processing.   This approach allows for more efficient processing of data

communication, reducing the need to inspect every packet in a flow and avoiding the need to terminate or establish a communication session associated with the data communication.

44.    The inventions disclosed in the '871 patent provide significant benefits and improvements to the function of the hardware in a computer network.  Specifically, the inventions taught by the '871 patent can determine whether a packet flow should be suspended for filtering a content request based on packet flow characteristics detected at the layers implemented in hardware.  This improves the efficiency and scalability of content filtering and other services, particularly for mobile data networks that carry delay-sensitive traffic such as voice or video streaming traffic.

45.    The '871 patent family has been cited by 962 United States and international patents and patent applications as relevant prior art.  166 United States and international patents and patent applications have cited the '871 patent itself as relevant prior art.  The following companies and research institutions have cited the '871 patent as relevant prior art:

- A10 Networks, Inc.
- Thoma Bravo, LLC
- AT&T, Inc.
- NEC Corporation
- Nokia Corporation
- Cisco Systems, Inc.
- Juniper Networks, Inc.
- Fujitsu Limited

### U.S. PATENT NO. 8,429,169

46.    U.S. Patent No. 8,429,169 (the "'169 patent") entitled, *Systems and Methods For Video Cache Indexing*, was filed on July 29, 2011.  The '169 patent claims priority to U.S. Provisional Patent Application No. 61/369,513, which was filed on July 30, 2010.  A true and correct copy of the '169 patent is attached hereto as Exhibit 5.

47.     The '169 patent has been in full force and effect since its issuance.  OptiMorphix, Inc. owns by assignment the entire right, title, and interest in and to the '169 patent.

48.     The '169 patent is directed to solving the problem of inefficient caching of content, particularly when dynamic URLs are used to refer to the content.  Traditional caching methods that index content based on URLs can lead to multiple cache entries for the same content or entries with expired references, reducing the efficiency and capacity of the cache.  The technologies taught in the '169 patent overcomes these inefficiencies by indexing the content cache based on a characterization of the content rather than the URL.

49.     The '169 patent identifies the shortcomings of the prior art.  Specifically, that conventional content caching methods, especially those employing dynamic URLs, lead to two main inefficiencies: (a) multiple cache entries corresponding to the same video content, thereby reducing the cache's capacity to serve unique content, and (b) content cache entries with expired references to content, reducing the useful capacity of the content cache.  These inefficiencies hinder the performance of middleware services and website performance.

50.     The '169 patent teaches the use of a novel approach to cache video content by indexing the content cache based on a characterization of the video content rather than the URL. This method involves identifying characterization data related to the content request and using a hash function to generate an index.  This index is then used to identify the corresponding entry in the cache data structure.  By avoiding the use of dynamic URLs in the indexing process, the patent's method allows for more efficient caching, eliminating redundancies and invalid entries, and improving the overall efficiency of content delivery.

51.     The inventions disclosed in the '169 patent provide significant benefits and improvements to the function of the hardware in a computer network by enabling more efficient

caching of video content.  By indexing the content cache based on the characterization of the content rather than the URL, the patented method avoids the problems of redundant and invalid cache entries.  This leads to better utilization of cache capacity, reduced burden on network infrastructure and web servers, and faster content delivery to users.  The invention also allows for distinguishing between similar but non-identical videos, avoiding content aliasing, and ensuring that the correct content is delivered to the user.

52.     The '169 patent family has been cited by 92 United States and international patents and patent applications as relevant prior art.  Specifically, patents issued to the following companies and research institutions have cited the '169 patent family as relevant prior art:

- Akamai Technologies, Inc.
- AMC Networks Inc.
- AT&T Inc.
- Atlassian Pty Ltd
- Canon Inc.
- Charter Communications, Inc.
- China Mobile Communications Corporation
- EchoStar Corporation
- Huawei Investment & Holding Co., Ltd.
- Interdigital, Inc.
- Juniper Networks, Inc.
- Koninklijke Philips Nv
- Microsoft Corporation
- Open Text Corporation
- SK Telecom Co., Ltd.
- Skyfire Labs, Inc., California
- ZTE Corporation

## U.S. PATENT NO. 8,521,901

53.     U.S. Patent No. 8,521,901 (the "'901 patent") entitled, *TCP Burst Avoidance*, was filed on December 22, 2008.  The '901 patent claims priority to Provisional Patent Application No. 61/017,275, filed on December 28, 2007.  The '901 patent is subject to a 35 U.S.C. § 154(b)

term extension of 525 days.  A true and correct copy of the '901 patent is attached hereto as Exhibit 6.

54.     The '901 patent has been in full force and effect since its issuance.  OptiMorphix, Inc. owns by assignment the entire right, title, and interest in and to the '901 patent.

55.     The '901 patent generally relates to methods and systems for minimizing packet bursts.  The '901 patent teaches implementing a packet scheduler layer between the network layer and the transport layer of a device, which smooths the delivery of TCP packets by delaying their delivery, thus addressing the challenges posed by the rapid and bursty transmission of data packets in network communications.

56.     The '901 patent is directed to solving the problem of TCP packet bursts in high-speed data networks, which can result from the buffering of TCP acknowledgment packets. These bursts can cause packet loss and inefficient use network bandwidth.

57.     The '901 patent identifies the shortcomings of the prior art.  Specifically, the specification describes that the prior art does not adequately address the issues of packet loss and inefficient bandwidth utilization resulting from the bursty nature of TCP packet transmission in data networks. The prior technologies do not effectively manage the sudden bursts of TCP acknowledgment packets, which can be caused by buffering, leading to suboptimal utilization of available bandwidth and undesirable packet loss.

58.     The '901 patent teaches the use of a packet scheduler layer, which is positioned between the network and transport layers of a device.  This layer receives, smoothens (by delaying), and sends TCP packets to ensure that the delivery of these packets is managed in a manner that mitigates the issues of packet bursts. The packet scheduler layer manages both incoming and outgoing packets, ensuring that the transmission of these packets is smoothed out,

thereby minimizing packet loss and ensuring more efficient use of available bandwidth. This approach provides benefits that differ from conventional methods by ensuring that TCP packet transmission is managed in a way that minimizes packet loss and ensures efficient bandwidth utilization, thereby addressing the specific challenges posed by TCP packet bursts in high-speed data networks.

59.     The invention taught by the '901 patent solves discrete, technological problems associated with computer systems; specifically, it addresses the issues of packet loss and inefficient bandwidth utilization in high-speed data networks by managing the transmission of TCP packets in a manner that smoothens their delivery, thereby ensuring that the available bandwidth is utilized efficiently, and that packet loss is minimized.

60.     The '901 patent family has been cited by 21 United States and international patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '901 patent family as relevant prior art:

- Lenovo Group Limited
- Telefonaktiebolaget Lm Ericsson
- Qualcomm, Inc.
- Nippon Telegraph & Telephone Corp.
- Hitachi, Ltd.
- Cisco Systems, Inc.
- Akamai Technologies, Inc.
- Huawei Technologies Co., Ltd.

**U.S. PATENT NO. 9,167,021**

61.     U.S. Patent No. 9,167,021 (the "'021 patent") entitled, *Measuring Web Browsing Quality of Experience in Real-Time at An Intermediate Network Node*, was filed on March 30, 2012. The '021 patent is subject to a 35 U.S.C. § 154(b) term extension of 265 days. A true and correct copy of the '021 patent is attached hereto as Exhibit 7.

62.     The '021 patent has been in full force and effect since its issuance.  OptiMorphix, Inc. owns by assignment the entire right, title, and interest in and to the '021 patent.

63.     The '021 patent is directed to solving the problem of accurately measuring the time needed to download a web page at an intermediate network node.  Traditional methods of measuring download time at the client or server level are straightforward, but complications arise when content for a single web page is distributed across several physical servers or when measuring at an intermediate network node.  The patent addresses these challenges by introducing a method to evaluate and compute the page unit time.

64.     The '021 patent identifies the shortcomings of the prior art.  Specifically, measuring the web page download time at an intermediate network node is practically not feasible due to the complexity of web page transactions.  The prior art lacks an effective method to measure the time taken to download a complete web page at an intermediate network node, especially when content is distributed across several servers or when dynamic URLs are generated by client-side scripts.

65.     The '021 patent teaches the use of a method that includes acquiring current HTTP transactions, determining their relation to web browsing for a specific client, and evaluating whether they belong with the previous transactions set.  By grouping transactions into page units and computing a page unit time, the method provides a way to measure the Quality of Experience (QoE) of web browsing in real-time at an intermediate network node.

66.     The inventions disclosed in the '021 patent provide significant benefits and improvements to the function of the hardware in a computer network by enabling real-time measurement of web browsing QoE at an intermediate network node.  This allows service providers to optimize network performance and take actions to enhance the browsing experience.

67.     The inventions taught by the '021 patent solve discrete, technological problems associated with computer systems and network performance.  Specifically, it addresses the technical challenges of measuring web browsing Quality of Experience (QoE) at an intermediate network node, considering the complexities of web page transactions, distributed content across servers, and dynamic URL generation.  The solution provided by the '021 patent is rooted in technological innovation and contributes to the optimization of network performance and user experience.

68.     The '021 patent family has been cited by 17 United States and international patents and patent applications as relevant prior art.  Specifically, patents issued to the following companies and research institutions have cited the '021 patent family as relevant prior art:

- BT Group plc
- Meta Platforms, Inc.
- Cisco Systems, Inc.
- Telefonaktiebolaget Lm Ericsson
- Tencent Holdings Ltd
- Apple Inc.
- Nippon Telegraph & Telephone Corp.
- EchoStar Corporation
- Intel Corporation

**U.S. PATENT NO. 9,191,664**

69.     U.S. Patent No. 9,191,664 (the "'664 patent") entitled, *Adaptive Bitrate Management for Streaming Media Over Packet Networks*, was filed on November 11, 2013.  The '664 patent claims priority to U.S. Provisional patent Application No. 60/948,917, which was filed on July 10, 2007.  A true and correct copy of the '664 patent is attached hereto as Exhibit 8.

70.     The '664 patent has been in full force and effect since its issuance.  OptiMorphix, Inc. owns by assignment the entire right, title, and interest in and to the '664 patent.

71.     The '664 patent is generally directed to adaptive bitrate management for streaming media over packet networks. Specifically, it aims to solve the problem of delivering multimedia content over capacity-limited, shared wireless links. Challenges like sudden bandwidth fluctuations, packet loss, reduction in effective capacity, and limited total bitrate budgets make consistent high-quality streaming difficult over wireless networks. Further, the '664 patent teaches ways to quickly respond to changes in network conditions by adjusting the bitrate and the media encoding scheme to optimize the viewing and listening experience of the user. It addresses the issue of transferring a fixed bitrate over a connection that cannot provide the necessary throughput, which can lead to undesirable effects such as network buffer overflow, packet loss, and media player buffer underflow.

72.     The prior art has several shortcomings that the '664 patent identifies. Specifically, existing protocols for rate control in media streaming over packet networks were not fully equipped to handle the challenges posed by wireless networks. These challenges include sudden adjustments of nominal transmission rate, packet loss, reduction of effective bandwidth, and limited capacity.

73.     To address these issues, the '664 patent teaches in one embodiment an adaptive bitrate manager that monitors feedback information to estimate network conditions. The media is encoded according to the optimal bitrates and provided as encoded streams for transmission.

74.     Several benefits and improvements to computer network functionality are provided by the inventions disclosed in the '664 patent. Quickly responding to changes in available network bandwidth allows maintaining consistent streaming quality. Encoding audio and video based on network estimations optimizes the media performance within constrained wireless capacity. Avoiding underflows and overflows through bitrate adaptation enables stable streaming.

75.     The '664 patent solves technical problems rooted in streaming multimedia over wireless networks.  Challenges like packet loss and volatile transmission rates present discrete technological issues.  The '664 patent teaches specific techniques for dynamic adaptation of media encoding in response to feedback-based network estimates.  This constitutes an improvement to computer network technology by addressing these streaming challenges.

76.     The '664 patent family has been cited by 357 United States and international patents and patent applications as relevant prior art.  Specifically, patents issued to the following companies and research institutions have cited the '664 patent family as relevant prior art:

- Alphabet Inc.
- *Oracle Corporation*
- AT&T Inc.
- Telefonaktiebolaget LM Ericsson
- International Business Machines Corp.
- Microsoft Corporation
- Cisco Systems, Inc.
- DISH Network Corp.
- Broadcom Limited
- Amazon.com, Inc.
- Adobe Inc.
- Samsung Electronics Co., Ltd.
- Comcast Corporation
- Canon Inc.
- Technicolor S.A.
- Qualcomm, Inc.
- CommScope, Inc.
- Intel Corporation
- Meta Platforms, Inc.
- Hitachi, Ltd.
- Verizon Communications Inc.

## COUNT I
## INFRINGEMENT OF U.S. PATENT NO. 7,031,314

77.     Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

78.     Oracle designs, makes, uses, sells, and/or offers for sale in the United States products for providing differentiated services within a network communication system.

79.     Oracle designs, makes, sells, offers to sell, imports, and/or uses the following products: Oracle Cloud Infrastructure (including Oracle Traffic Management and Oracle Network Load Balancer) and Oracle Fusion Middleware Release 11g (11.1.1.9) and later (including Oracle Traffic Director 11.1.1.9 and later) (collectively, the "Oracle '314 Product(s)").

80.     One or more Oracle subsidiaries and/or affiliates use the Oracle '314 Products in regular business operations.

81.     The Oracle '314 Products comprise a processing unit.

82.     The Oracle '314 Products comprise a storage component, functionally connected to the processor, responsible for retaining data and instructions that, upon execution by the processor, direct the processor's operations.

83.     The memory unit in the Oracle '314 Products stores data related to connections, service applications, and other system elements.  In addition, the Oracle '314 Products store in memory instructions that guide the processor in classifying connections, forming connections, and redirecting data.

*Flexible, fast, and efficient compute to power any workload | Oracle Live,* ORACLE YOUTUBE CHANNEL TRAINING (March 16, 2022), available at: https://www.youtube.com/watch?v=yAP0yqJyPhc

84.      The Oracle '314 Products contain functionality for requesting a connection between the client and server to ascertain if it aligns with predefined service criteria, where the predetermined service criteria are linked to at least one of the multiple service applications.

85.      The Oracle '314 Products perform differentiated services within a network communication system.  Specifically, The Oracle '314 Products contain functionality for classifying a connection that has been requested between the client and the server to determine whether the connection matches predetermined service criteria.  When a connection is requested, various attributes of the request are analyzed by the Oracle '314 Products.  These attributes could include the source, destination, requested service type, priority, or other data associated with the connection.

86.      The Oracle '314 Products compare attributes associated with a connection against predetermined service criteria.  Specifically, the predetermined service criteria can include a set of rules or conditions associated with various service applications.

*Oracle Traffic Director – Technical Deep Dive and Deployment Best Practices*, ORACLE PRESENTATION at 23 (2015) (emphasis added).

87.     The Oracle '314 Products contain functionality for establishing an initial connection between the client and the service module, and a subsequent connection between the service module and the server when the connection aligns with the predefined service requirements.

Oracle Fusion Middleware - Administering Oracle Traffic Director, Oracle Documentation Version 12c at 2-2 (November 2022) (annotation added).

88.    The Oracle '314 Products include functionality that enables forming two connections: a first connection between the client and the service module, and a second connection between the service module and a server.  The forming of a first and second connection is done by the Oracle '314 Products in response to a connection matching the predetermined service criteria.

89.    The Oracle '314 Products orchestrate the formation of a connection between the client and the service module, following the protocols and parameters that relate to the classified service criteria.

90.    The Oracle '314 Products establish a connection between the service module and a server.

91.     The Oracle '314 Products comprise functionality that utilizes the initial and secondary connections to redirect a portion or more of the data communication between the client and a server towards the service application related to the pre-established service parameters.

92.     The Oracle '314 Products comprise a service module that manages the flow of data between the client and the server, directing a portion or all of the data to specific service applications based on the matched criteria.

93.     Oracle has directly infringed and continues to directly infringe the '314 patent by, among other things, making, using, offering for sale, and/or selling technology comprising a system for performing differentiated services within a network communication system, including but not limited to the Oracle '314 Products.

94.     The Oracle '314 Products are available to businesses and individuals throughout the United States.

95.     The Oracle '314 Products are provided to businesses and individuals located in this District.

96.     By making, using, testing, offering for sale, and/or selling products and services comprising a system for performing differentiated services within a network communication system, including but not limited to the Oracle '314 Products, Oracle has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '314 patent, including at least claim 27 pursuant to 35 U.S.C. § 271(a).

97.     Oracle also indirectly infringes the '314 patent by actively inducing infringement under 35 U.S.C. § 271(b).

98.     Oracle has had knowledge of the '314 patent since at least service of this Complaint or shortly thereafter, and Oracle knew of the '314 patent and knew of its infringement, including by way of this lawsuit.

99.     Alternatively, Oracle has had knowledge of the '314 patent since at least July 15, 2008, based on its citation of the '314 patent as relevant prior art in at least 17 patents that are assigned to and owned by Oracle, including:

- U.S. Patent No. 7,401,158 (granted July 15, 2008)
- U.S. Patent No. 7,412,481 (granted August 12, 2008)
- U.S. Patent No. 7,426,059 (granted September 16, 2008)
- U.S. Patent No. 7,454,423 (granted November 18, 2008)
- U.S. Patent No. 7,668,917 (granted February 23, 2010)
- U.S. Patent No. 7,899,879 (granted March 01, 2011)
- U.S. Patent No. 7,904,823 (granted March 08, 2011)
- U.S. Patent No. 7,912,899 (granted March 22, 2011)
- U.S. Patent No. 7,941,542 (granted May 10, 2011)
- U.S. Patent No. 7,945,846 (granted May 17, 2011)
- U.S. Patent No. 8,001,185 (granted August 16, 2011)
- U.S. Patent No. 8,165,993 (granted April 24, 2012)
- U.S. Patent No. 8,255,454 (granted August 28, 2012)
- U.S. Patent No. 8,402,095 (granted March 19, 2013)
- U.S. Patent No. 8,566,693 (granted October 22, 2013)
- U.S. Patent No. 8,577,989 (granted November 05, 2013)
- U.S. Patent No. 9,094,258 (granted July 28, 2015)

100.     Oracle intended to induce patent infringement by third-party customers and users of the Oracle '314 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement.  Oracle specifically intended and was aware that the normal and customary use of the accused products

would infringe the '314 patent.  Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '314 patent and with the knowledge that the induced acts would constitute infringement.  For example, Oracle provides the Oracle '314 Products that have the capability of operating in a manner that infringe one or more of the claims of the '314 patent, including at least claim 27, and Oracle further provides documentation and training materials that cause customers and end users of the Oracle '314 Products to utilize the products in a manner that directly infringe one or more claims of the '314 patent.[14]  By providing instruction and training to customers and end-users on how to use the Oracle '314 Products in a manner that directly infringes one or more claims of the '314 patent, including at least claim 27, Oracle specifically intended to induce infringement of the '314 patent.  Oracle engaged in such inducement to promote the sales of the Oracle '314 Products, e.g., through Oracle user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '314 patent.  Accordingly, Oracle has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '314 patent, knowing that such use constitutes infringement of the '314 patent.

101.    The '314 patent is well-known within the industry as demonstrated by multiple citations to the '314 patent in published patents and patent applications assigned to technology companies and academic institutions.  Oracle is utilizing the technology claimed in the '314 patent

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[14] *See e.g.*, *Oracle Traffic Director – Technical Deep Dive and Deployment Best Practices,* ORACLE PRESENTATION (2015); *Oracle Fusion Middleware - Administering Oracle Traffic Director12c (12.2.1.1.0)*, ORACLE DOCUMENTATION (June 2016); *Oracle Fusion Middleware - Installing Oracle Traffic Director 12c (12.2.1.1.0)*, ORACLE DOCUMENTATION (June 2016); *Secure and operate your cloud network with ease | Oracle Live*, ORACLE YOUTUBE CHANNEL (March 16, 2022), available at: https://www.youtube.com/watch?v=eGkafLHdWuM; and *Oracle Cloud Infrastructure Documentation – Traffic Management,* ORACLE HELP CENTER (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/Content/TrafficManagement/Concepts/overview.htm.

without paying a reasonable royalty.  Oracle is infringing the '314 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

102.    To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '314 patent.
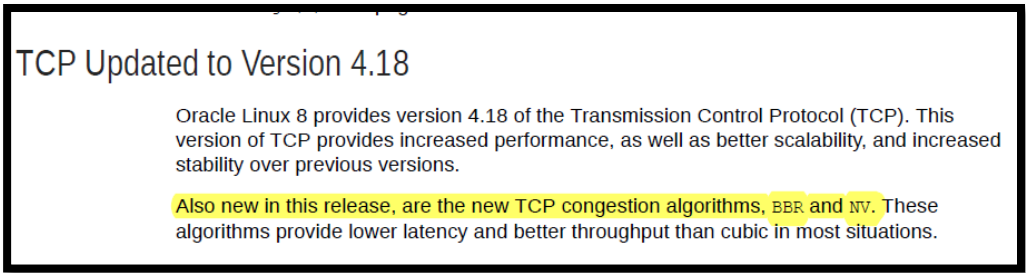
103.    As a result of Oracle's infringement of the '314 patent, Plaintiff has suffered monetary damages, and seeks recovery in an amount adequate to compensate for Oracle's infringement, but in no event less than a reasonable royalty for the use made of the invention by Oracle together with interest and costs as fixed by the Court.

## COUNT II
## INFRINGEMENT OF U.S. PATENT NO. 7,099,273

104.    Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

105.    Oracle designs, makes, uses, sells, and/or offers for sale in the United States products comprising systems and methods for data transport acceleration and management within a network communication system.

106.    Oracle designs, makes, sells, offers to sell, imports, and/or uses the following products: Oracle Linux Release 7.5 and later on x86-64 architectures and Oracle Linux Release 7.5 and later on 64-bit ARM architectures (collectively, the "Oracle '273 Product(s)").

**TCP Updated to Version 4.18**

Oracle Linux 8 provides version 4.18 of the Transmission Control Protocol (TCP). This version of TCP provides increased performance, as well as better scalability, and increased stability over previous versions.

Also new in this release, are the new TCP congestion algorithms, BBR and NV. These algorithms provide lower latency and better throughput than cubic in most situations.

*Oracle Linux 8 Release Notes for Oracle Linux 8*, ORACLE DOCUMENTATION at 2-19 (September 2022) (emphasis added).

107.    One or more Oracle subsidiaries and/or affiliates use the Oracle '273 Products in regular business operations.
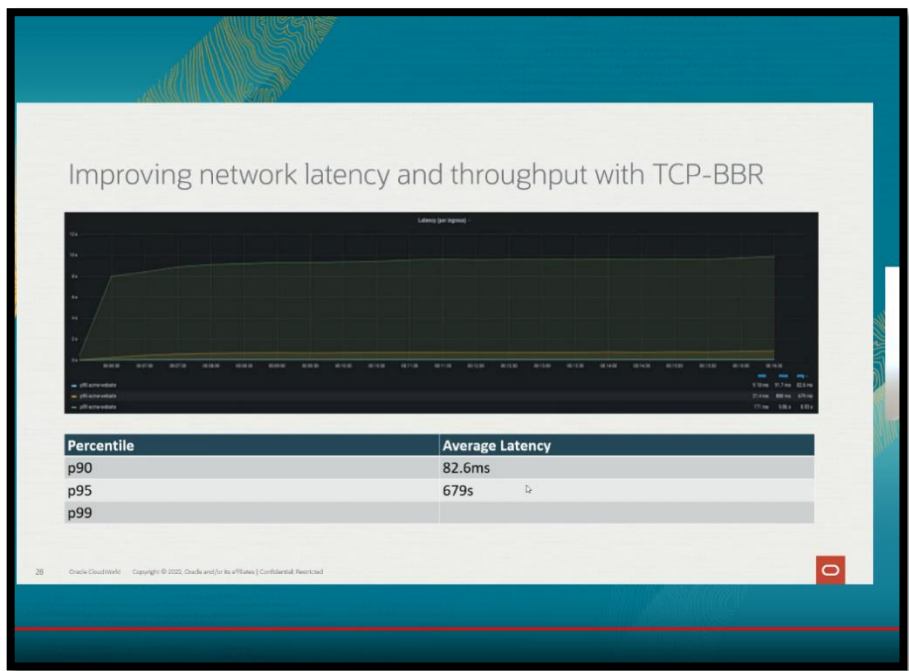


*Adventures with ingress controllers | CloudWorld 2022*, ORACLE YOUTUBE CHANNEL (November 28, 2022), available at: https://www.youtube.com/watch?v=3zPHi3uMvwI ("it stands for Bottle Bandwidth and Roundtrip propagation time.  And as you can see, it improves the average latency. And it can also improve the throughput apparently by a factor of three times in this case.").

108.    One or more of the Oracle '273 Products include technology that performs the step of establishing a data connection between a sender and receiver using a handshake process.

> Notable performance improvements include:
> Improvements and fixes to **NUMA balancing** help resolve issues that could cause high I/O wait times when this feature was enabled. NUMA balancing is automatically enabled on systems that have multiple NUMA nodes.
>
> **RDMA over Converged Ethernet** (RoCE), a standard InfiniBand Trade Association (IBTA) protocol enables efficient data transfer for RDMA over Ethernet networks using UDP encapsulation to transcend Layer 3 networks.
>
> **TCP-BBR**, a feature that can be used to achieve higher bandwidth and lower latency for internet traffic can offer significant performance improvements for internet-based applications. BBR (Bottleneck Bandwidth and Round-Trip Time) is a scheduling algorithm that helps to control the transmit rate of the TCP protocol to reduce buffering by monitoring round-trip times against bandwidth bottlenecks to reduce TCP congestion.

*Oracle Linux How-To for Sysadmins and Developers*, ORACLE LINUX WEBSITE (last visited October 2023), available at: https://www.oracle.com/linux/technologies/

109.    The Oracle '273 Products send a TCP packet with the SYN (Synchronize) flag set to the server.  This packet contains an initial sequence number (ISN), which helps the server and client synchronize their sequence numbers.  The ISN used by the Oracle '273 Products are represented as "x."  Upon receiving the SYN packet, the Oracle '273 Products sends a TCP packet back with both the SYN and ACK flags set.  This packet contains two pieces of information: the responsive ISN, usually represented as 'y,' and an acknowledgment number, which is the ISN plus one (x+1).  The acknowledgment number is used to confirm that the sender has received the SYN packet.

110.    In establishing a connection between the sender and the receiver after receiving the SYN-ACK packet, the Oracle '273 Products send another packet with the ACK flag set.  This packet contains an acknowledgment number, which is the ISN plus one (y+1).

111.    The Oracle '273 Products measure round trip times (RTT) of packets sent between a client and server over a network.  Specifically, the Oracle '273 Products measure the round-trip propagation time (RTprop) using the minimum round-trip time (RTT) for the connection by

keeping track of the lowest observed RTT in the recent past.  This value represents the round-trip propagation time (RTprop) of the connection.

112.    The Oracle '273 Products perform timestamping.  Specifically, when an Oracle '273 Product transmits a data packet, it records the current time as a timestamp.  The timestamp is stored in the transmission control block (TCB), which maintains the state of the TCP connection, including RTT measurements and other relevant information.

113.    The Oracle '273 Products perform acknowledgment processing.  Specifically, the Oracle '273 Products send an acknowledgment (ACK) for a specific packet, the sender processes the ACK and identifies the corresponding packet in the TCB.  By matching the ACK with the original packet, the Oracle '273 Products retrieve the original timestamp associated with that packet.

114.    The Oracle '273 Products perform a round-trip time (RTT) calculation. Specifically, the Oracle '273 Products calculate the RTT for a specific packet by subtracting the original timestamp from the current time when the ACK is received.  This gives an individual RTT sample for that packet as explained in the below excerpt.



Neal Cardwell, Yunchung Cheng, et al,, *BBR Congestion Control*, GOOGLE IETF 97: SEOUL PRESENTATION at 9 (November 2016) (emphasis added) (describing RTT_sample = ACK_receive_time - original_timestamp).

115.    The Oracle '273 Products perform the step of MinRTT estimation.  Specifically, the Oracle '273 Products maintain a running estimate of the minimum RTT observed (MinRTT) over a specified time window.  The MinRTT is used by the Oracle '273 Products to estimate the base round-trip propagation time without queuing delay.  When a new RTT sample is calculated, the Oracle '273 Products compare it with the current MinRTT value.  If the new sample is lower than the existing MinRTT, the Oracle '273 Products update MinRTT with a new value.

116.    The Oracle '273 Products perform round-trip time-based pacing.  Specifically, the Oracle products use the MinRTT estimate in performing pacing rate and congestion window calculations to ensure the sending rate is adapted based on the observed network conditions.  BBR's pacing rate and congestion window calculations factor in the MinRTT value to maintain a balance between efficient data transfer and minimal congestion.

To match the packet-arrival rate to the bottleneck link's departure rate, BBR paces every data packet. BBR must match the bottleneck *rate,* which means pacing is integral to the design and fundamental to operation— pacing_rate is BBR's primary control parameter. A secondary parameter, cwnd_gain, bounds inflight to a small multiple of the BDP to handle common network and receiver pathologies (see the later section on Delayed and Stretched ACKs). Conceptually, the TCP send routine looks like the following code. (In Linux, sending uses the efficient FQ/pacing queuing discipline,[4] which gives BBR line-rate single-connection performance on multigigabit links and handles thousands of lower-rate paced connections with negligible CPU overhead.)

Neal Cardwell, Yuchung Cheng, C. Stephen Gunn, Soheil Hassas Yeganeh, Van Jacobson, *BBR: Congestion-Based Congestion Control*, ACM Queue, Sep/Oct 2016 and CACM, Feb 2017 (emphasis added).

117.    The Oracle '273 Products calculate a congestion window parameter, which defines the maximum quantity of unacknowledged data packets permitted to be transmitted to the recipient.

118.    The Oracle '273 Products calculate a pacing rate based on these estimates to determine how quickly it should transmit data.

119.    The Oracle '273 Products calculate a congestion window.  Specifically, the Oracle '273 Products calculate a cwnd value based on the estimated bottleneck bandwidth (BtlBw) and RTT to ensure the congestion window is large enough not to limit the sending rate derived from the BtlBw and RTT estimates.  This is done by setting the cwnd to the product of the estimated BtlBw and RTT: cwnd = BtlBw * RTT.  The calculation done by the Oracle '273 Products ensures that the cwnd value is large enough to accommodate the in-flight data based on the BtlBw and RTT estimates, while also accounting for potential variations in network conditions.

120.    The Oracle '273 Products calculate a congestion window (cwnd) based on the bottleneck bandwidth (BtlBw) and round-trip time (RTT) estimates to ensure the sending rate is not constrained by the window size.  The cwnd effectively sets a limit on the number of unacknowledged data packets in transit, but it is not set by a specific parameter for the maximum number of unacknowledged packets.

121.    The Oracle '273 Products transmit additional data packets to the receiver in response to a transmit timer expiration.  The period of the transmit timer is based on the round-trip time measurements and the congestion window parameter.

122.    Oracle has directly infringed and continues to directly infringe the '273 patent by, among other things, making, using, offering for sale, and/or selling technology for transferring

data from a sender to a receiver in a communication network, including but not limited to the Oracle '273 Products.

123.    The Oracle '273 Products are available to businesses and individuals throughout the United States.

124.    The Oracle '273 Products are provided to businesses and individuals located in the District of Delaware.

125.    By making, using, testing, offering for sale, and/or selling products and services for transferring data from a sender to a receiver in a communication network, including but not limited to the Oracle '273 Products, Oracle has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '273 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

126.    Oracle also indirectly infringes the '273 patent by actively inducing infringement under 35 U.S.C. § 271(b).

127.    Oracle has had knowledge of the '273 patent since at least service of this Complaint or shortly thereafter, and Oracle knew of the '273 patent and knew of its infringement, including by way of this lawsuit.

128.    Alternatively, Oracle has had knowledge of the '273 patent since at least July 15, 2008, based on its citation of the '273 patent and patent family as relevant prior art in at least 36 patents that are assigned to and owned by Oracle, including:

- U.S. Patent No. 9,384,072 (granted July 05, 2016)
- U.S. Patent No. 9,256,555 (granted February 09, 2016)
- U.S. Patent No. 9,336,158 (granted May 10, 2016)
- U.S. Patent No. 8,937,949 (granted January 20, 2015)
- U.S. Patent No. 9,021,123 (granted April 28, 2015)
- U.S. Patent No. 8,804,752 (granted August 12, 2014)

COMPLAINT FOR PATENT INFRINGEMENT

- U.S. Patent No. 8,832,216 (granted September 09, 2014)
- U.S. Patent No. 8,879,579 (granted November 04, 2014)
- U.S. Patent No. 8,850,085 (granted September 30, 2014)
- U.S. Patent No. 9,118,597 (granted August 25, 2015)
- U.S. Patent No. 9,094,258 (granted July 28, 2015)
- U.S. Patent No. 9,069,705 (granted June 30, 2015)
- U.S. Patent No. 9,069,633 (granted June 30, 2015)
- U.S. Patent No. 9,069,485 (granted June 30, 2015)
- U.S. Patent No. 9,191,452 (granted November 17, 2015)
- U.S. Patent No. 9,148,352 (granted September 29, 2015)
- U.S. Patent No. 7,412,481 (granted August 12, 2008)
- U.S. Patent No. 7,401,158 (granted July 15, 2008)
- U.S. Patent No. 7,454,423 (granted November 18, 2008)
- U.S. Patent No. 7,426,059 (granted September 16, 2008)
- U.S. Patent No. 7,475,402 (granted January 06, 2009)
- U.S. Patent No. 7,668,917 (granted February 23, 2010)
- U.S. Patent No. 7,574,710 (granted August 11, 2009)
- U.S. Patent No. 8,402,095 (granted March 19, 2013)
- U.S. Patent No. 8,484,392 (granted July 09, 2013)
- U.S. Patent No. 8,255,454 (granted August 28, 2012)
- U.S. Patent No. 8,589,610 (granted November 19, 2013)
- U.S. Patent No. 8,577,989 (granted November 05, 2013)
- U.S. Patent No. 8,566,693 (granted October 22, 2013)
- U.S. Patent No. 8,165,993 (granted April 24, 2012)
- U.S. Patent No. 7,912,899 (granted March 22, 2011)
- U.S. Patent No. 7,904,823 (granted March 08, 2011)
- U.S. Patent No. 7,899,879 (granted March 01, 2011)
- U.S. Patent No. 7,945,846 (granted May 17, 2011)
- U.S. Patent No. 7,941,542 (granted May 10, 2011)
- U.S. Patent No. 8,001,185 (granted August 16, 2011)

129.    Oracle intended to induce patent infringement by third-party customers and users of the Oracle '273 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement.  Oracle specifically intended and was aware that the normal and customary use of the accused products would infringe the '273 patent.  Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '273 patent and with the knowledge that the induced acts would constitute infringement.  For example, Oracle provides the Oracle '273 Products that have the capability of operating in a manner that infringe one or more of the claims of the '273 patent, including at least claim 1, and Oracle further provides documentation and training materials that cause customers and end users of the Oracle '273 Products to utilize the products in a manner that directly infringe one or more claims of the '273 patent.[15]  By providing instruction and training to customers and end-users on how to use the Oracle '273 Products in a manner that directly infringes one or more claims of the '273 patent, including at least claim 1, Oracle specifically intended to induce infringement of the '273 patent.  Oracle engaged in such inducement to promote the sales of the Oracle '273 Products, e.g., through Oracle user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '273 patent.  Accordingly, Oracle has induced and continues to

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[15] *See e.g., Announcing the general availability of the Unbreakable Enterprise Kernel Release 5,* ORACLE LINUX BLOG (June 21, 2018), available at: https://blogs.oracle.com/linux/post/announcing-the-general-availability-of-the-unbreakable-enterprise-kernel-release-5; *Oracle Linux 8 Release Notes for Oracle Linux 8*, ORACLE DOCUMENTATION (September 2022); *Unbreakable Enterprise Kernel Release Notes for Unbreakable Enterprise Kernel Release 5 E95779-18*, ORACLE DOCUMENTATION (January 2023); *Adventures with ingress controllers | CloudWorld 2022*, ORACLE YOUTUBE CHANNEL (November 28, 2022), available at: https://www.youtube.com/watch?v=3zPHi3uMvwI; and *Oracle Linux How-To for Sysadmins and Developers*, ORACLE.COM LINUX WEBSITE (last visited October 2023), available at: https://www.oracle.com/linux/technologies/.

induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '273 patent, knowing that such use constitutes infringement of the '273 patent.

130.     The '273 patent is well-known within the industry as demonstrated by multiple citations to the '273 patent in published patents and patent applications assigned to technology companies and academic institutions.  Oracle is utilizing the technology claimed in the '273 patent without paying a reasonable royalty.   Oracle is infringing the '273 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

131.     To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '273 patent.

132.     As a result of Oracle's infringement of the '273 patent, Plaintiff has suffered monetary damages, and seeks recovery 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. 7,444,418

133.     Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

134.     Oracle designs, makes, uses, sells, and/or offers for sale in the United States products that transcode multimedia information within a network communication system.

135.     Oracle designs, makes, sells, offers to sell, imports, and/or uses the following products: Oracle WebRTC Session Border Controller and Oracle Communications Session Border Controller Releases S-CZ7.2.0 and later (collectively, the "Oracle '418 Product(s)").

136.    One or more Oracle subsidiaries and/or affiliates use the Oracle '418 Products in regular business operations.

137.    The Oracle '418 Products intercept digital multimedia information transmitted between a sender and a recipient, where the data is encoded at the sender using a primary transmission rate.

> Transcoding processing is viewed in terms of the ingress and egress realms. The ingress realm is where the SDP offer is received by the Oracle Communications Session Border Controller. The egress realm is where the SDP offer is sent, and where the SDP answer is expected to be received from (i.e., the answerer's realm). A call is defined as transcodable if an egress or ingress policy exists for the session and if the session is not subject to media release, as specified in the realm configuration.
>
> To understand the details of transcoding processing, refer to the following diagram. An SDP offer, O0, is received by the Oracle Communications Session Border Controller in the ingress realm. The ingress codec policy is applied here and the SDP offer is transformed into O1. O1 is then passed to and processed by the egress codec policy. This SDP message is then forwarded to the answerer as O2. The answerer replies with A0 to the Oracle Communications Session Border Controller, which is subjected to the egress codec policy again and transformed into A1.
>
> When policy dictates not to transcode the call, the Result SDP sent back to the offerer is based on the common codecs shared between A1 and O1. The Oracle Communications Session Border Controller first constructs the list of codecs that are present in both in O1 and A1. Then, the Oracle Communications Session Border Controller maintains the codec order from A1 for the Result as it is sent to the offerer.

*Oracle Session Border Controller Configuration Guide Release S-Cz8.4.0,* ORACLE DOCUMENTATION at 19-5 (February 2023) (emphasis added).

138.    The Oracle '418 Products contain functionality that performs the step of intercepting digital multimedia information communicated between a transmitter and a receiver, with the digital multimedia information encoded at the transmitter at a first transmission rate. Specifically, the multimedia information is captured by the Oracle '418 Products as it is encoded at the transmitter side at a specific first transmission rate.  This rate denotes the speed at which the data is being sent and is related to the compression methods used to make the data suitable for transmission.

139.    The Oracle '418 Products calculate the accessible transmission rate for a connection on the recipient end, in which the estimation process involves determining the round-trip time for data packets exchanged between the service module and the recipient through the secondary communication channel.

140.    The Oracle '418 Products contain functionality for estimating an available transmission rate of a receiver-side connection.  This step is critical for dynamically adapting the multimedia stream to match the capabilities of the receiving end and the conditions of the network. The estimation process performed by the Oracle '418 Products involves measuring the trip time of data packets communicated between the service module and the receiver via the second channel. By accurately gauging the available bandwidth, the Oracle '418 Products can dynamically adapt to the multimedia stream.

141.    The Oracle '418 Products contain functionality wherein if the initial transmission rate exceeds the transmission rate, the digital multimedia information is transcoded to adapt it to the available transmission rate, ensuring compatibility.

142.    The Oracle '418 Products contain functionality that, if the first transmission rate is greater than the available transmission rate, transcodes the digital multimedia information to conform the digital multimedia information to the available transmission rate.  Specifically, the Oracle '418 Products determine if there is a need for transcoding by comparing the first transmission rate (original encoding rate) with the estimated available transmission rate.

143.    If the Oracle '418 Products determine there is a need for transcoding, the Oracle '418 Products convert the media data from one format and/or bitrate to another.  Specifically, the Oracle '418 Products alter the bit rate of the media data to match the estimated available transmission rate.

> A codec policy performs actions conditionally when any of its parameters includes a conditional value. A conditional value includes a target codec paired with a requirement for executing the action. The Oracle Communications Session Border Controller manipulates SDP according to this value pair when the ingress SDP or a previous manipulation to the SDP meets the condition criteria. You can configure conditional manipulation by extending upon the syntax of the following core parameters in the codec-policy configuration element:
>
> - allow-codecs,
> - add-codecs-on-egress, and
> - order-codecs.
>
> The system establishes conditions on a codec policy as a sequence of allowing, adding, and re-ordering. Each step in this sequence can occur with or without conditions. Allowing is required. Any applied policy, whether or not it is conditional, without an allow blocks all traffic. Allow all, using the wildcard asterisk character is a typical setting. Adding applies only to egress policies.
>
> To establish conditions, you configure the parameter with pairs that consist of target codecs followed by the conditions that trigger the action. Each policy parameter can include one or more of these pairs. When configuring a parameter with multiple values, you enclose them within parenthesis, whether or not there are conditions.

*Oracle Session Border Controller Configuration Guide Release S-Cz8.4.0,* ORACLE DOCUMENTATION at 19-47 (February 2023) (emphasis added).

144.	The Oracle '418 Products contain functionality for performing conditional transcoding based on real-time network conditions.

145.	The Oracle '418 Products convey transcoded multimedia data to the recipient via the receiver-end connection, utilizing a transmission rate derived from the estimated accessible transmission rate.

146.	The Oracle '418 Products transmit transcoded multimedia information to the receiver over the receiver-side connection at a transmission rate determined from the estimated available transmission rate.

147.	The Oracle '418 Products enable packaging multimedia information into suitable data packets for transmission.

148.	The Oracle '418 Products transmit encoded data packets over a network to the receiver via transmission protocols.

149.     Oracle has directly infringed and continues to directly infringe the '418 patent by, among other things, making, using, offering for sale, and/or selling technology that transcode multimedia information within a network communication system, including but not limited to the Oracle '418 Products.

150.     The Oracle '418 Products are available to businesses and individuals throughout the United States.

151.     The Oracle '418 Products are provided to businesses and individuals located in this District.

152.     By making, using, testing, offering for sale, and/or selling products and services that transcode multimedia information within a network communication system, including but not limited to the Oracle '418 Products, Oracle has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '418 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

153.     Oracle also indirectly infringes the '418 patent by actively inducing infringement under 35 U.S.C. § 271(b).

154.     Oracle has had knowledge of the '418 patent since at least service of this Complaint or shortly thereafter, and Oracle knew of the '418 patent and knew of its infringement, including by way of this lawsuit.

155.     Oracle intended to induce patent infringement by third-party customers and users of the Oracle '418 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement.  Oracle specifically intended and was aware that the normal and customary use of the accused products would infringe the '418 patent.  Oracle performed the acts that constitute induced infringement,

and would induce actual infringement, with knowledge of the '418 patent and with the knowledge that the induced acts would constitute infringement.  For example, Oracle provides the Oracle '418 Products that have the capability of operating in a manner that infringe one or more of the claims of the '418 patent, including at least claim 1, and Oracle further provides documentation and training materials that cause customers and end users of the Oracle '418 Products to utilize the products in a manner that directly infringe one or more claims of the '418 patent.[16]  By providing instruction and training to customers and end-users on how to use the Oracle '418 Products in a manner that directly infringes one or more claims of the '418 patent, including at least claim 1, Oracle specifically intended to induce infringement of the '418 patent.  Oracle engaged in such inducement to promote the sales of the Oracle '418 Products, e.g., through Oracle user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '418 patent.  Accordingly, Oracle has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '418 patent, knowing that such use constitutes infringement of the '418 patent.

156.    The '418 patent is well-known within the industry as demonstrated by multiple citations to the '418 patent in published patents and patent applications assigned to technology companies and academic institutions.  Oracle is utilizing the technology claimed in the '418 patent

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[16] *See e.g.*, *WebRTC: Web real-time communication – Technical Solutions,* ORACLE CLOUD INFRASTRUCTURE BLOG, (March 3, 2022), available at: https://blogs.oracle.com/cloud-infrastructure/post/webrtc-web-real-time-communication, *Oracle Communications WebRTC Session Controller Installation Guide, Release 7.2 E69510-02*, ORACLE DOCUMENTATION (April 2017); *Oracle Communications WebRTC Session Controller Security Guide Release 7.2*, ORACLE DOCUMENTATION (May 2016); *Oracle Communications Session Border Controller - Maintenance and Troubleshooting Guide Release S-Cz8.3.0*, ORACLE DOCUMENTATION (August 2021); *Oracle Communications Session Border Controller Configuration Guide Release S-Cz8.4.0*, ORACLE DOCUMENTATION (February 2023); *Oracle Communications Session Border Controller & Session Router - Release Notes S-CZ7.4.0*, ORACLE DOCUMENTATION (October 2018); and *Oracle Communications WebRTC Session Controller Media Engine Object Reference Release 7.2*, ORACLE DOCUMENTATION (June 2016).

without paying a reasonable royalty.  Oracle is infringing the '418 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

157.    To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '418 patent.

158.    As a result of Oracle's infringement of the '418 patent, Plaintiff has suffered monetary damages, and seeks recovery 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. 7,586,871

159.    Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

160.    Oracle designs, makes, uses, sells, and/or offers for sale in the United States products that process data communications passing through a node between a first data network and a second data network.
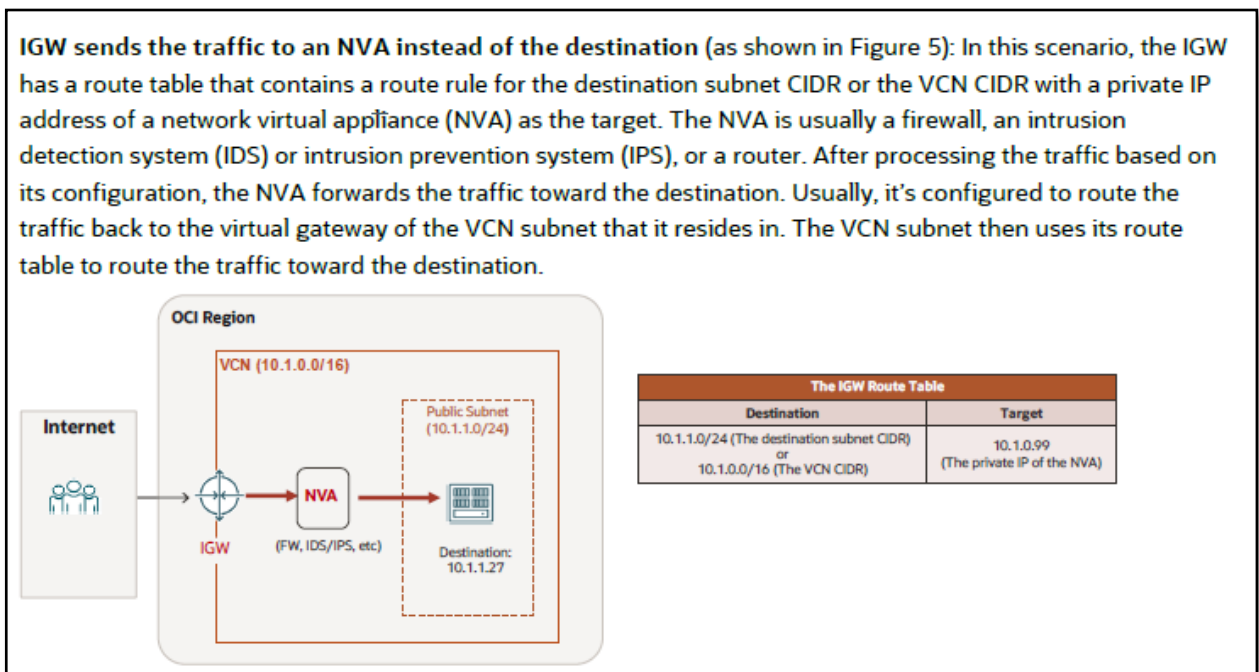
161.    Oracle designs, makes, sells, offers to sell, imports, and/or uses the following products: Oracle Cloud Infrastructure products and services (including Threat Intelligence and Network Firewall functionality) (the "Oracle '871 Product(s)").

162.    One or more Oracle subsidiaries and/or affiliates use the Oracle '871 Products in regular business operations.

163.    The Oracle '871 Products detect an event associated with a data communication arriving at the node from a first data network.

164.    The Oracle '871 Products monitor incoming data packets at the node from a first data network.

165.    The Oracle '871 Products determine whether the data communication is to be suspended for service at the node based on the detected event.   Specifically, once an event associated with the data communication is detected by the Oracle '871 Products, the system evaluates the nature and severity of the event.  The decision to suspend or allow the communication is based on rules and policies configured by the Oracle '871 Products.

IGW sends the traffic to an NVA instead of the destination (as shown in Figure 5): In this scenario, the IGW has a route table that contains a route rule for the destination subnet CIDR or the VCN CIDR with a private IP address of a network virtual appliance (NVA) as the target. The NVA is usually a firewall, an intrusion detection system (IDS) or intrusion prevention system (IPS), or a router. After processing the traffic based on its configuration, the NVA forwards the traffic toward the destination. Usually, it's configured to route the traffic back to the virtual gateway of the VCN subnet that it resides in. The VCN subnet then uses its route table to route the traffic toward the destination.

| The IGW Route Table | |
| --- | --- |
| Destination | Target |
| 10.1.1.0/24 (The destination subnet CIDR) or 10.1.0.0/16 (The VCN CIDR) | 10.1.0.99 (The private IP of the NVA) |

*Learn Routing in Oracle Cloud Infrastructure Networking with Examples*, ORACLE WHITEPAPER at 10 (September 2023).

166.    The Oracle '871 Products determine (based on a detected event) whether the data communication should be suspended at the node.

167.    The Oracle '871 Products process one or more suspended data communications using information in the suspended data communication.  Specifically, the Oracle '871 Products isolate the suspended data communication for (at least in part) the purpose of processing the

suspended data communication.  Based on the analysis and processing, the Oracle '871 Products

determine how to handle the suspended data communication.



The rule action defines how the firewall handles the packet if it matches the specified conditions. The firewall
can perform the following actions:

- **Allow traffic:** The traffic is allowed to proceed.
- **Drop traffic:** The traffic is dropped silently, no notification of reset is sent.
- **Intrusion detection:** Logs the traffic
- **Intrusion prevention:** Blocks the traffic.

> ✓ **Important**
>
> To use intrusion detection and prevention, you must also enable logging. See Logs.

- **Reject traffic:** The traffic is dropped and a reset notification is sent.

You can create security rules one at a time, or you can import many at the same time using a `.json` file. See
Bulk Importing Policy Components more information.

*Oracle Network Firewall – Policy Components*, ORACLE CLOUD INFRASTRUCTURE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/Content/network-firewall/policy-components.htm

168.    The Oracle '871 Products detect a return data communication arriving at the node

from the second data network in response to the processed data communication from the first data

network.  Further, the Oracle '871 Products allow the detected return data communication to pass

through the node without processing.

169.    The Oracle '871 Products monitor the incoming data communication from the

second data network.  If the detected return data communication is associated with prior processed

data communication from the first network the Oracle '871 Products determine that the return data

communication does not need further processing at the node.

170.    The Oracle '871 Products process a suspended data communication based on

information in the data communication.

```java
import com.oracle.bmc.ConfigFileReader;
import com.oracle.bmc.auth.AuthenticationDetailsProvider;
import com.oracle.bmc.auth.ConfigFileAuthenticationDetailsProvider;
import com.oracle.bmc.networkfirewall.NetworkFirewallClient;
import com.oracle.bmc.networkfirewall.model.*;
import com.oracle.bmc.networkfirewall.requests.*;
import com.oracle.bmc.networkfirewall.responses.*;
import java.math.BigDecimal;

import java.util.ArrayList;
import java.util.HashMap;
import java.util.Date;
import java.util.UUID;
import java.util.Arrays;


public class CreateNetworkFirewallPolicyExample {
    public static void main(String[] args) throws Exception {

        /**
         * Create a default authentication provider that uses the DEFAULT
         * profile in the configuration file.
         * Refer to <see href="https://docs.cloud.oracle.com/en-us/iaas/Content/API/Concepts/sdkcon
         */
        final ConfigFileReader.ConfigFile configFile = ConfigFileReader.parseDefault();
        final AuthenticationDetailsProvider provider = new ConfigFileAuthenticationDetailsProvider(

        /* Create a service client */
        NetworkFirewallClient client = NetworkFirewallClient.builder().build(provider);

        /* Create a request and dependent object(s). */
    CreateNetworkFirewallPolicyDetails createNetworkFirewallPolicyDetails = CreateNetworkFirewallPo
        .displayName("EXAMPLE-displayName-Value")
        .compartmentId("ocid1.test.oc1..<unique_ID>EXAMPLE-compartmentId-Value")
        .freeformTags(new HashMap<java.lang.String, java.lang.String>() {
```

*API Reference and EndPoints – CreateNetworkFirewallPolicyDetails,* ORACLE CLOUD INFRASTRUCTURE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/api/#/en/network-firewall/20230501/datatypes/CreateNetworkFirewallPolicyDetails (showing how to request data required to create a network firewall policy which can include the further processing of a suspended data communication).

171.    Oracle has directly infringed and continues to directly infringe the '871 patent by, among other things, making, using, offering for sale, and/or selling technology that process data communications passing through a node between a first data network and a second data network, including but not limited to the Oracle '871 Products.

172.    The Oracle '871 Products are available to businesses and individuals throughout the United States.

COMPLAINT FOR PATENT INFRINGEMENT

173.    The Oracle '871 Products are provided to businesses and individuals located in this District.

174.    By making, using, testing, offering for sale, and/or selling products and services that process data communications passing through a node between a first data network and a second data network, including but not limited to the Oracle '871 Products, Oracle has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '871 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

175.    Oracle also indirectly infringes the '871 patent by actively inducing infringement under 35 U.S.C. § 271(b).

176.    Oracle has had knowledge of the '871 patent since at least service of this Complaint or shortly thereafter, and Oracle knew of the '871 patent and knew of its infringement, including by way of this lawsuit.

177.    Oracle intended to induce patent infringement by third-party customers and users of the Oracle '871 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement.  Oracle specifically intended and was aware that the normal and customary use of the accused products would infringe the '871 patent.  Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '871 patent and with the knowledge that the induced acts would constitute infringement.  For example, Oracle provides the Oracle '871 Products that have the capability of operating in a manner that infringe one or more of the claims of the '871 patent, including at least claim 1, and Oracle further provides documentation and training materials that cause customers and end users of the Oracle '871 Products to utilize the

products in a manner that directly infringe one or more claims of the '871 patent.[17]  By providing

instruction and training to customers and end-users on how to use the Oracle '871 Products in a

manner that directly infringes one or more claims of the '871 patent, including at least claim 1,

Oracle specifically intended to induce infringement of the '871 patent.  Oracle engaged in such

inducement to promote the sales of the Oracle '871 Products, e.g., through Oracle user manuals,

product support, marketing materials, and training materials to actively induce the users of the

accused products to infringe the '871 patent.  Accordingly, Oracle has induced and continues to

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

way to infringe the '871 patent, knowing that such use constitutes infringement of the '871 patent.

178.    The '871 patent is well-known within the industry as demonstrated by multiple

citations to the '871 patent in published patents and patent applications assigned to technology

companies and academic institutions.  Oracle is utilizing the technology claimed in the '871 patent

without paying a reasonable royalty.  Oracle is infringing the '871 patent in a manner best

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[17] *See e.g.*, *Address Emerging Threats with OCI Security,* ORACLE LEARNING YOUTUBE CHANNEL (April 18, 2022), available at: https://www.youtube.com/watch?v=l0Od2Tn5MUw; *Oracle Cloud Security – Preparing for the New Normal*, ORACLE PRESENTATION (March 29, 2023); *Oracle Day One and Beyond: Security QuickStart,* ORACLE LEARNING YOUTUBE CHANNEL (June 7, 2023), available at: https://www.youtube.com/watch?v=QQyN7fY_ZbQ; *Learn Routing in Oracle Cloud Infrastructure Networking with Examples*, ORACLE WHITEPAPER (September 2023); *Oracle Cloud Infrastructure Documentation, Overview of Network Firewall,* ORACLE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/Content/network-firewall/overview.htm; *OCI Network Firewall: Unveiling policy model transformations and performance advances,* ORACLE CLOUD SECURITY BLOG (October 17, 2023), available at: https://blogs.oracle.com/cloudsecurity/post/announcing-enhancements-to-oci-network-firewall-v2; *Secure your workloads using Oracle Cloud Infrastructure Network Firewall Service*, ORACLE ARCHITECTURE CENTER (August 23, 2022), available at: https://docs.oracle.com/en/solutions/oci-network-firewall/index.html; *OCI Network Firewall - Concepts and Deployment*, ORACLE A-TEAM CHRONICLES (July 24, 2022), available at: https://www.ateam-oracle.com/post/oci-network-firewall---concepts-and-deployment; and *Defense in Depth, Layering using OCI Network Firewall*, ORACLE CLOUD SECURITY BLOG (July 21, 2022), available at: https://blogs.oracle.com/cloudsecurity/post/defense-in-depth-layering-using-oci-network-firewall.

described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

179.    To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '871 patent.

180.    As a result of Oracle's infringement of the '871 patent, Plaintiff has suffered monetary damages, and seeks recovery 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. 8,429,169

181.    Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

182.    Oracle designs, makes, uses, sells, and/or offers for sale in the United States products comprising technology for video cache indexing.

183.    Oracle designs, makes, sells, offers to sell, imports, and/or uses the following products: Oracle Cloud Infrastructure (OCI) (the "Oracle '169 Product(s)").

184.    One or more Oracle subsidiaries and/or affiliates use the Oracle '169 Products in regular business operations.

185.    The Oracle '169 Products receive a request for content from a device connected to the Internet.  Specifically, when a user makes a request to the Oracle '169 Products, an HTTP request is sent over the Internet.  This HTTP request is received by the Oracle '169 Products, which are listening for incoming connections on the specific IP address and port number assigned (usually port 80 for HTTP and 443 for HTTPS).  The request includes details such as the requested URL, HTTP method (e.g., GET, POST), headers, and any additional data.

- A main webapp domain.

- IP address of the LBaaS or other public facing endpoint of the application.

- Ability to update DNS records for the domain.

- The WAF service only supports traffic on ports 80/443; however, after requests reach the WAF on ports 80/443, we're able to send the requests to your origin server on any port necessary. The following is an example:

End User → Port 80/443 → WAF → Port 443/8000/555/*** → Origin Server
Ensure that your application isn't running on other ports.

*Getting Started with Edge Policies*, ORACLE CLOUD INFRASTRUCTURE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/Content/WAF/Concepts/gettingstarted.htm

186.    The Oracle '169 Products query a web server for a specific segment of content related to the user's content request.  Once the Oracle '169 Products have received and parsed the request, the Oracle '169 Products determine how to handle the request based on its configuration rules.  If the requested content is not available in the Oracle '169 Products' caches, the Oracle '169 Products may act as a reverse proxy and forward the request to the appropriate origin server.  The web server processes this request and returns the requested content back to the Oracle '169 Products.
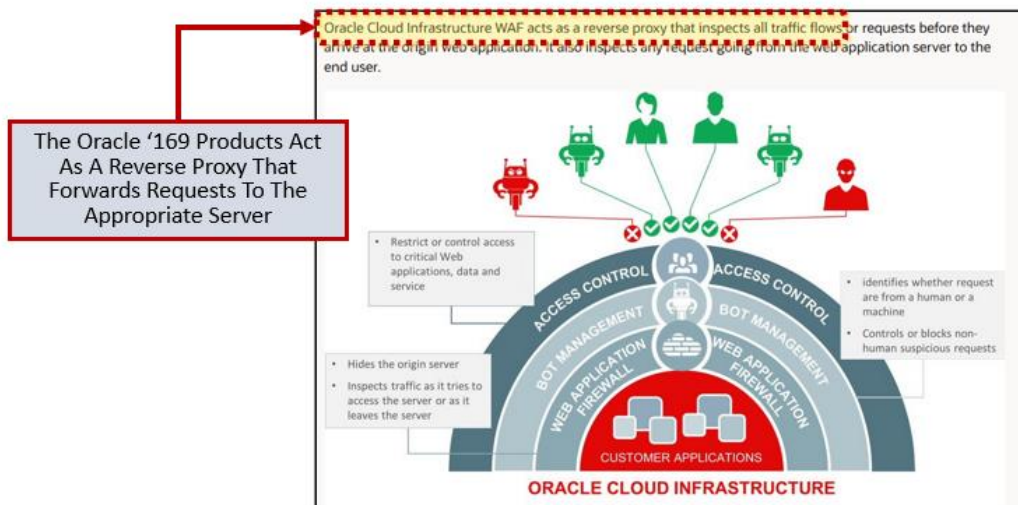


*Introducing the Oracle Cloud Infrastructure Web Application Firewall,* ORACLE CLOUD INFRASTRUCTURE BLOG (February 15, 2019), available at: https://blogs.oracle.com/cloud-

infrastructure/post/introducing-the-oracle-cloud-infrastructure-web-application-firewall (annotation added).

187.    The Oracle '169 Products identify one or more descriptors for the content corresponding to the user's request, where these descriptors include the particular content segment associated with the initial request.



*Caching Rules,* ORACLE CLOUD INFRASTRUCTURE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/Content/WAF/Tasks/cachingrules.htm (annotation added).

188.    The Oracle '169 Products compute an index related to the requested content by applying the identified descriptors to a hashing function, wherein this computed index aids in locating a corresponding entry in a cache data structure by matching against indices tied to existing entries.

*Oracle Infrastructure As A Service (IAAS) Tools Java 3.27.0 SDK*, ORACLE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/tools/java/3.27.0/ (annotation added).

189.    The Oracle '169 Products, acting as a reverse proxy, receive a request and processes it according to the rules defined in the Oracle '169 Products' configuration files.  The Oracle '169 Products use the HTTP protocol to communicate with client devices and web servers.  When a request is received, the Oracle '169 Products extract the request line, headers, and body from the request packet.  The request line contains the request method (such as GET, POST, PUT, or DELETE), the request URL, and any query string or fragment identifier.  The headers contain metadata about the request, such as the client's IP address, browser type, and any authentication credentials.  The body contains the data sent with the request, such as form data or file uploads.

```
84          * **HTTP_METHOD_IS:** Matches if the request method is identical to one of the values
85          * listed in field. The {@code value} in this case is string with one or multiple HTTP
86          * methods separated by new line symbol \ The list of available methods: {@code GET}, {@code
87          * HEAD}, {@code POST}, {@code PUT}, {@code DELETE}, {@code CONNECT}, {@code OPTIONS},
88          * {@code TRACE}, {@code PATCH}
89          *
90          * <p>Example:* "GET\ POST"
91          *
92          * <p>- **HTTP_METHOD_IS_NOT:** Matches if the request is not identical to any of the
93          * contents of the {@code value} field. The {@code value} in this case is string with one or
94          * multiple HTTP methods separated by new line symbol \ The list of available methods:
95          * {@code GET}, {@code HEAD}, {@code POST}, {@code PUT}, {@code DELETE}, {@code CONNECT},
96          * {@code OPTIONS}, {@code TRACE}, {@code PATCH}
97          *
98          * <p>Example:* "GET\ POST"
```

*Oracle Cloud Infrastructure oci-java-sdk – AccessRuleCriteria.java*, ORACLE GITHUB REPOSITORY (last visited October 2023) (The list of available methods: {@code GET}, {@code HEAD}, {@code POST}, {@code PUT}, {@code DELETE}, {@code CONNECT}, {@code OPTIONS}, {@code TRACE}, {@code PATCH}").

190.    The Oracle '169 Products then use the request line and headers to determine how to process the request. For example, if the request method is GET, the Oracle '169 Products will retrieve the requested content from a web server and return it to the client. If the request method is POST, the Oracle '169 Products will pass the request body to a web server for processing and return the server's response to the client. Characterization data includes data such as URL, Content-Type, ETag, Last-Modified date, etc. When the Oracle '169 Products receive content from the origin server, it also receives headers that contain this metadata. This metadata can be used to characterize the content for caching purposes.

191.    When storing a response in the cache, the Oracle '169 Products generate a key using a hash function. This key is used to store and retrieve the cached content efficiently.

192.    Once the Oracle '169 Products have determined that it needs to retrieve content from a web server, the Oracle '169 Products send a request to the server using the HTTP protocol. The request includes the request line, headers, and any data from the client's request that needs to be passed to the server. The Oracle '169 Products can be configured to use different algorithms

to choose the web server that will receive the request.  For example, the Oracle '169 Products can use a round-robin algorithm to distribute requests across multiple servers, or the Oracle '169 Products can use a least-connections algorithm to send requests to the server with the fewest active connections.

```
70            * @param includeByteArrayContents true to include the full contents of byte arrays
71            * @return string representation
72            */
73  ∨       public String toString(boolean includeByteArrayContents) {
74              java.lang.StringBuilder sb = new java.lang.StringBuilder();
75              sb.append("RoundRobinLoadBalancingMethod(");
76              sb.append("super=").append(super.toString(includeByteArrayContents));
77              sb.append(")");
78              return sb.toString();
79          }
80
```

*Oracle Cloud Infrastructure oci-java-sdk* – RoundRobinLoadBalancingMethod.java, ORACLE GITHUB REPOSITORY (last visited October 2023) (identifying the use of Round Robin Load Balancing).

193.    Once the request is sent to the web server, the Oracle '169 Products wait for the server's response.  The response includes a status line, headers, and a body containing the requested content.  The Oracle '169 Products then extract the content from the response body and store it in a cache.

194.    The Oracle '169 Products process the content to identify characterization data that can be used to cache the content.  The characterization data is a compact representation of the content that allows the Oracle '169 Products to quickly determine whether it has a cached copy of the content that is identical to the requested content.  The Oracle '169 Products can use various algorithms to generate characterization data, such as a checksum, a hash function, or a compression algorithm.  For example, a checksum can be used for small pieces of data, while a hash function can be used for larger pieces of data.  The characterization data is then stored in the Oracle '169

Products cache, along with the content, so that it can be quickly retrieved when a subsequent request for the same content is received.

195.     The Oracle '169 Products generate an index corresponding to content associated with the received content request by inputting the at least one identified characterization data into a hash function, wherein the generated index is used for identifying, in the cache data structure, an entry associated with the content by comparing the generated index to one or more index fields associated with one or more entries within the cache data structure.

196.     The Oracle '169 Products use a hash function to generate an index that corresponds to the content.  The hash function takes the characterization data as input and generates a unique output that can be used to identify the content in the Oracle '169 Products' cache.  The hash function used by the Oracle '169 Products can be a simple hash function, such as the Jenkins hash function, or a more complex hash function, such as the SHA-256 hash function.

197.     Oracle has directly infringed and continues to directly infringe the '169 patent by, among other things, making, using, offering for sale, and/or selling technology comprising video cache indexing, including but not limited to the Oracle '169 Products.

198.     The Oracle '169 Products are available to businesses and individuals throughout the United States.

199.     The Oracle '169 Products are provided to businesses and individuals located in this District.

200.     By making, using, testing, offering for sale, and/or selling products and services comprising technology for video cache indexing, including but not limited to the Oracle '169 Products, Oracle has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '169 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

201.    Oracle also indirectly infringes the '169 patent by actively inducing infringement under 35 U.S.C. § 271(b).

202.    Oracle has had knowledge of the '169 patent since at least service of this Complaint or shortly thereafter, and Oracle knew of the '169 patent and knew of its infringement, including by way of this lawsuit.

203.    Oracle intended to induce patent infringement by third-party customers and users of the Oracle '169 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement.  Oracle specifically intended and was aware that the normal and customary use of the accused products would infringe the '169 patent.  Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '169 patent and with the knowledge that the induced acts would constitute infringement.  For example, Oracle provides the Oracle '169 Products that have the capability of operating in a manner that infringe one or more of the claims of the '169 patent, including at least claim 1, and Oracle further provides documentation and training materials that cause customers and end users of the Oracle '169 Products to utilize the products in a manner that directly infringe one or more claims of the '169 patent.[18]  By providing instruction and training to customers and end-users on how to use the Oracle '169 Products in a manner that directly infringes one or more claims of the '169 patent, including at least claim 1,

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[18] *See e.g.*, *Oracle Cloud Infrastructure Web Application Firewall – Data Sheet*, ORACLE DOCUMENTATION (2019); *Oracle Infrastructure As A Service (IAAS) Tools Java 3.27.0 SDK*, ORACLE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/tools/java/3.27.0/; *Getting Started with Edge Policies*, ORACLE CLOUD INFRASTRUCTURE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/Content/WAF/Concepts/gettingstarted.htm; and *Introducing the Oracle Cloud Infrastructure Web Application Firewall,* ORACLE CLOUD INFRASTRUCTURE BLOG (February 15, 2019), available at: https://blogs.oracle.com/cloud-infrastructure/post/introducing-the-oracle-cloud-infrastructure-web-application-firewall.

Oracle specifically intended to induce infringement of the '169 patent.  Oracle engaged in such inducement to promote the sales of the Oracle '169 Products, e.g., through Oracle user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '169 patent.  Accordingly, Oracle has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '169 patent, knowing that such use constitutes infringement of the '169 patent.

204.    The '169 patent is well-known within the industry as demonstrated by multiple citations to the '169 patent in published patents and patent applications assigned to technology companies and academic institutions.  Oracle is utilizing the technology claimed in the '169 patent without paying a reasonable royalty.  Oracle is infringing the '169 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

205.    To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '169 patent.

206.    As a result of Oracle's infringement of the '169 patent, Plaintiff has suffered monetary damages, and seek recovery 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. 8,521,901

207.    Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

208.    Oracle designs, makes, uses, sells, and/or offers for sale in the United States products comprising technology for a data packet scheduler that reduces packet bursts.

209.    Oracle designs, makes, sells, offers to sell, imports, and/or uses the following

products: Oracle Communications Session Border Controller Releases S-CZ7.2.0 and later (the

"Oracle '901 Product(s)").

210.    One or more Oracle subsidiaries and/or affiliates use the Oracle '901 Products in

regular business operations.

211.    The Oracle '901 Products receive a transmission control protocol (TCP) packet

from a sending layer on the first device.  The sending layer is one of the network interface layer or

the transport layer and the TCP packet is sent over a connection between the first device and a

second device.

> The main aspects treated here focused on which traffic is desired under a realm, so
> each design needs to consider the following, previous to any configuration:
>
> 1.  SIP Traffic: SIP over UDP/TCP (unsecured transport) or over TLS (secured
>     transport protocol).
>
> 2.  Media Traffic: media over RTP, media over SRTP or media over both RTP and
>     SRTP allowed at the same time. This would differentiate the IP design, since:
>
>     a.  For media over RTP only or SRTP only, just one IP address will be used for
>         them
>
>     b.  For media over both RTP/SRTP allowed at the same time, then the
>         recommendation is to use two different IPs on the same network-interface.
>         One will send RTP traffic and the other IP will be used for SRTP traffic. This
>         should be considered for correct IP plan under the network.

*Oracle Communications Session Border Controller Security Guide Release SCz8.2.0*, ORACLE
DOCUMENTATION at M-5 (December 2018) (emphasis added).

212.    Oracle '901 Products contain functionality for receiving and sending TCP packets

and comprise functionality for optimizing the flow of data between devices over various network

paths.

213.    Oracle '901 Products store information about the connection between a first device

and a second device.  The information stored by the Oracle '901 products include a last packet

delivery time for a specific connection/link.   Specifically, the Oracle '901 products store

information about the network connection, such as metrics regarding packet delivery, latency, and

jitter, to optimize the path selection and improve performance.

- RTP and RTCP average jitter—Incremental number of packets for both RTP and RTCP that have been used to generate the total and max jitter since the beginning of the call or the last context memory poll. The incremental accumulated jitter (in milliseconds) over all the packets received.
- RTP and RTCP maximum jitter—Maximum single jitter value (in milliseconds) for both RTP and RTCP from all the packets since the beginning of the call or the last context memory poll.
- RTCP average latency—Number of RTCP frames over which latency statistics have been accumulated and the incremental total of latency values reported since the beginning of the call or the last context memory poll.
- RTCP maximum latency—Highest latency value measured since the beginning of the call or the last context memory poll.
- RTP packet count
- RTP bytes sent and received

*Oracle Communications Session Border Controller Configuration Guide Release S-Cz9.1.0,* ORACLE DOCUMENTATION at 11-32 (September 2023) (emphasis added).

214.    Oracle '901 Products determine if a TCP packet is part of a bursty transmission on

the connection by looking at whether a burst count for the connection is greater than a burst-count

threshold.

> A session-agent can be configured for max-outbound-sessions, max-sessions, max-burst-rate and max-sustain-rate.
>
> Max-outbound-sessions and max-sessions give the max number of allowed concurrent sessions. Set these to match what should be sent to an upstream session-agent (for example a service provider) or accepted into a core session-agent.
>
> The session-agent's max-burst-rate and max-sustain-rate are used to throttle the calls per second (CPS) of traffic sent to and by that session-agent. Each of these parameters has its own configurable window by which the statistics are gauged for constraint exceptions.
>
> For the sustained-rate, the average is calculated over the previous window (equal to the sustained-rate-window) and current window fragment. The window fragment will be between 0 and the configured sustained-rate-window upon receipt of an Invite. Once the window fragment increments and reaches the sustained-rate-window, this rotates and becomes the previous window -- and a new window fragment begins at 0. At this point all calculations are re-calibrated accordingly.

*Oracle Communications Session Border Controller Security Guide Release SCz8.2.0*, ORACLE DOCUMENTATION at 3-15 (December 2018) (emphasis added).

215.     Oracle '901 Products calculate a delay time for a connection using the last packet delivery time after determining that the TCP packet is part of a bursty transmission.  Specifically, the Oracle '901 Products measure latency and jitter for each connection/link.  This measurement is then used to determine the burstiness of a TCP packet transmission.

216.     The Oracle '901 Products contain functionality for delivering the TCP packet to a receiving layer based on the calculated delay time, wherein the receiving layer is either the network interface layer or the transport layer that is not the sending layer.  Specifically, the Oracle '901 Products manage packet transmission times and delays as part of the Oracle '901 Product's traffic optimization and prioritization functionality.

> The multiple stream mechanism is designed to solve the head-of-the-line blocking problem of TCP. Therefore, messages from different multiplexed flows do not block one another.
>
> A stream can be thought of as a sub-layer between the transport layer and the upper layer. SCTP supports multiple logical streams to improve data transmission throughput. As shown in the above figure, SCTP allows multiple unidirectional streams within an association. This multiplexing/de-multiplexing capability is called multi-streaming and it is achieved by introducing a field called Stream Identifier contained in every DATA chunk) that is used to differentiate segments in different streams.
>
> SIP transactions are mapped into SCTP streams as described in Section 5.1 of RFC 4168. In what it describes as the simplest way, the RFC suggests (keyword SHOULD) that all SIP messages be transmitted via Stream 0 with the U bit set to 1.

*Oracle Communications Session Border Controller Configuration Guide Release S-Cz9.1.0*, ORACLE DOCUMENTATION at 3-74 (September 2023) (emphasis added)

217.    The Oracle '901 Products enable sending the TCP packet to the receiving layer.

218.    Oracle has directly infringed and continues to directly infringe the '901 patent by, among other things, making, using, offering for sale, and/or selling technology for a data packet scheduler that reduces packet bursts, including but not limited to the Oracle '901 Products.

219.    The Oracle '901 Products are available to businesses and individuals throughout the United States.

220.    The Oracle '901 Products are provided to businesses and individuals located in this District.

221.    By making, using, testing, offering for sale, and/or selling products and services comprising technology for a data packet scheduler that reduced packet bursts, including but not limited to the Oracle '901 Products, Oracle has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '901 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

222.    Oracle also indirectly infringes the '901 patent by actively inducing infringement under 35 U.S.C. § 271(b).

223.    Oracle has had knowledge of the '901 patent since at least service of this Complaint or shortly thereafter, and Oracle knew of the '901 patent and knew of its infringement, including by way of this lawsuit.

224.    Oracle intended to induce patent infringement by third-party customers and users of the Oracle '901 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement.  Oracle specifically intended and was aware that the normal and customary use of the accused products would infringe the '901 patent.  Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '901 patent and with the knowledge that the induced acts would constitute infringement.  For example, Oracle provides the Oracle '901 Products that have the capability of operating in a manner that infringe one or more of the claims of the '901 patent, including at least claim 1, and Oracle further provides documentation and training materials that cause customers and end users of the Oracle '901 Products to utilize the products in a manner that directly infringe one or more claims of the '901 patent.[19]  By providing instruction and training to customers and end-users on how to use the Oracle '901 Products in a manner that directly infringes one or more claims of the '901 patent, including at least claim 1, Oracle specifically intended to induce infringement of the '901 patent.  Oracle engaged in such inducement to promote the sales of the Oracle '901 Products, e.g., through Oracle user manuals,

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[19] *See e.g.*, *Oracle Communications Session Border Controller Configuration Guide Release S-Cz9.1.0,* ORACLE DOCUMENTATION (September 2023); *Oracle Communications Session Border Controller - Maintenance and Troubleshooting Guide Release S-Cz8.3.0*, ORACLE DOCUMENTATION (August 2021); *Oracle Communications Session Border Controller Configuration Guide Release S-Cz8.4.0*, ORACLE DOCUMENTATION (February 2023); *Oracle Communications Session Border Controller & Session Router - Release Notes S-CZ7.4.0*, ORACLE DOCUMENTATION (October 2018); and *Oracle Communications Session Border Controller Security Guide Release  SCz8.2.0*, ORACLE DOCUMENTATION (December 2018) (emphasis added).

product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '901 patent.  Accordingly, Oracle has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '901 patent, knowing that such use constitutes infringement of the '901 patent.

225.    The '901 patent is well-known within the industry as demonstrated by multiple citations to the '901 patent in published patents and patent applications assigned to technology companies and academic institutions.  Oracle is utilizing the technology claimed in the '901 patent without paying a reasonable royalty.  Oracle is infringing the '901 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

226.    To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '901 patent.

227.    As a result of Oracle's infringement of the '901 patent, Plaintiff has suffered monetary damages, and seek recovery 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. 9,167,021

228.    Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

229.    Oracle designs, makes, uses, sells, and/or offers for sale in the United States products comprising technology for HTTP transaction analysis for web browsing session segmentation.

230.    Oracle designs, makes, sells, offers to sell, imports, and/or uses the following products: Oracle Cloud Infrastructure (OCI) and Oracle Cloud Management (OCM) (including Oracle IT Analytics and Application Performance Monitoring) (the "Oracle '021 Product(s)").

231.    One or more Oracle subsidiaries and/or affiliates use the Oracle '021 Products in regular business operations.

232.    The Oracle '021 Products capture an ongoing Hypertext Transfer Protocol (HTTP) interaction.

233.    The Oracle '021 Products ascertain if the active HTTP interaction is associated with web browsing.
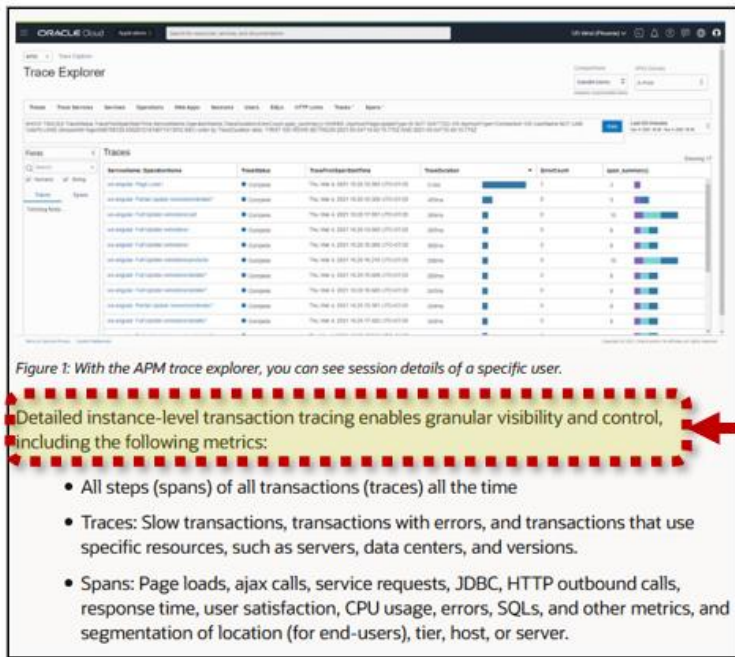


*Announcing general availability of Oracle Cloud Infrastructure Application Performance Monitoring*, ORACLE CLOUD INFRASTRUCTURE BLOG (March 11, 2021), available at: https://blogs.oracle.com/cloud-infrastructure/post/announcing-general-availability-of-oracle-cloud-infrastructure-application-performance-monitoring;

234.    The Oracle '021 Products analyze the "User-Agent" string within HTTP headers to distinguish between various types of HTTP traffic.  This includes differentiating between actual web browsers and, for example, API requests or bots.

235.    The Oracle '021 Products retrieve a historical set of transactions for a designated client.



*Using Oracle Application Performance Monitoring*, ORACLE MANAGEMENT CLOUD SERVICE DOCUMENTATION    (last    visited    October    2023),    available    at: https://docs.oracle.com/en/cloud/paas/management-cloud/apmcs/monitor-page-performance.html

236.    The Oracle '021 Products employ browser cookies, LocalStorage, and server-side session IDs to store and fetch a historical set of transactions specific to a client.

237.    The Oracle '021 Products assess if the active HTTP interaction is related to the archived set of transactions for that client.

238.    The Oracle '021 Products employ sequence pattern recognition to understand whether a current HTTP transaction logically fits within a set of prior transactions.

239.     The Oracle '021 Products, upon confirming the active HTTP interaction's relation to the historical set, incorporate the current interaction into that set.

240.     Upon determining that a transaction is related to the prior set, the Oracle '021 Products update their data structures to include the new transaction as a part of the existing set. This involves manipulating data objects that contain HTTP transactions as properties or list elements.

241.     When the active HTTP interaction is deemed unrelated to the historical transaction set, the Oracle '021 Products delineate a page unit comprising the archived HTTP interactions for the purpose of calculating page unit time.

## Monitor Page Performance

Your customers access web pages in your application, and they expect superior performance. Slow page loads, high page response times, failed transactions frustrate your application users. As the DevOps administrator, you need tools to monitor page performance and get deep visibility into all web pages, transactions, and so on. Oracle Application Performance Monitoring also enables you to track errors that affect page performance.

In the Oracle Application Performance Monitoring home page, the **Pages** tile displays the top five pages. Click the page that you want to view details about.

If the page you are looking for is not among the top five:

    1. In the left pane, click **Pages** to see a list of Pages.

    2. Click the name of a page to view the page details.

AVERAGE PAGE LOAD BREAKDOWN
Page Ready 158.13 ms    First Byte 5 ms
Interactive 135.31 ms
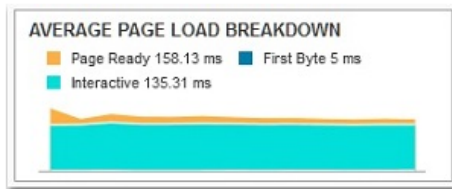
- In the above example, the page cart.jsp started its loading with the first byte at 5 milliseconds, and the page became interactive at 135 milliseconds. The page was completely loaded and ready for customer input at 158 milliseconds, and this is probably an issue because the page

*Using Oracle Application Performance Monitoring*, ORACLE MANAGEMENT CLOUD SERVICE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en/cloud/paas/management-cloud/apmcs/monitor-page-performance.html

242.    In cases where a transaction is evaluated as not belonging to the current set, a 'page boundary' is created by the Oracle '021 Products.  This boundary serves as a cutoff for metrics calculations like average time spent on a page or session.

243.    Oracle has directly infringed and continues to directly infringe the '021 patent by, among other things, making, using, offering for sale, and/or selling technology comprising HTTP transaction analysis for web browsing session segmentation, including but not limited to the Oracle '021 Products.

244. The Oracle '021 Products are available to businesses and individuals throughout the United States.

245. The Oracle '021 Products are provided to businesses and individuals located in this District.

246. By making, using, testing, offering for sale, and/or selling products and services comprising technology for HTTP transaction analysis for web browsing session segmentation, including but not limited to the Oracle '021 Products, Oracle has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '021 patent, including at least claim 1 pursuant to 35 U.S.C. § 271(a).

247. Oracle also indirectly infringes the '021 patent by actively inducing infringement under 35 U.S.C. § 271(b).

248. Oracle has had knowledge of the '021 patent since at least service of this Complaint or shortly thereafter, and Oracle knew of the '021 patent and knew of its infringement, including by way of this lawsuit.

249. Oracle intended to induce patent infringement by third-party customers and users of the Oracle '021 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Oracle specifically intended and was aware that the normal and customary use of the accused products would infringe the '021 patent. Oracle performed the acts that constitute induced infringement, and would induce actual infringement, with knowledge of the '021 patent and with the knowledge that the induced acts would constitute infringement. For example, Oracle provides the Oracle '021 Products that have the capability of operating in a manner that infringe one or more of the claims of the '021 patent, including at least claim 1, and Oracle further provides documentation and

training materials that cause customers and end users of the Oracle '021 Products to utilize the products in a manner that directly infringe one or more claims of the '021 patent.[20]  By providing instruction and training to customers and end-users on how to use the Oracle '021 Products in a manner that directly infringes one or more claims of the '021 patent, including at least claim 1, Oracle specifically intended to induce infringement of the '021 patent.  Oracle engaged in such inducement to promote the sales of the Oracle '021 Products, e.g., through Oracle user manuals, product support, marketing materials, and training materials to actively induce the users of the accused products to infringe the '021 patent.  Accordingly, Oracle has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '021 patent, knowing that such use constitutes infringement of the '021 patent.

250.    The '021 patent is well-known within the industry as demonstrated by multiple citations to the '021 patent in published patents and patent applications assigned to technology companies and academic institutions.  Oracle is utilizing the technology claimed in the '021 patent without paying a reasonable royalty.  Oracle is infringing the '021 patent in a manner best

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[20] *See e.g.*, *Announcing general availability of Oracle Cloud Infrastructure Application Performance Monitoring*, ORACLE CLOUD INFRASTRUCTURE BLOG (March 11, 2021), available at: https://blogs.oracle.com/cloud-infrastructure/post/announcing-general-availability-of-oracle-cloud-infrastructure-application-performance-monitoring; *Oracle Cloud - Using Oracle IT Analytics Document No. E60701-42,* ORACLE DOCUMENTATION (August 2020); *Oracle Cloud APM tutorial: DEMO: Create custom RUM metrics,* ORACLE LEARNING YOUTUBE CHANNEL (August 1, 2022), available at: https://www.youtube.com/watch?v=iGZ08enM7t8; *Using Oracle Application Performance Monitoring*, ORACLE MANAGEMENT CLOUD SERVICE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en/cloud/paas/management-cloud/apmcs/monitor-page-performance.html; *Oracle Cloud APM tutorial part 1: Introduction and setup,* ORACLE LEARNING YOUTUBE CHANNEL (July 12, 2022), available at: https://www.youtube.com/watch?v=5WrV00D-vg0; and *Oracle Cloud – Using Oracle Application Performance Monitoring Document No. E60699-46*, *Oracle Documentation* (February 2021); *Oracle Cloud APM tutorial: DEMO: Create a custom dashboard,* ORACLE LEARNING YOUTUBE CHANNEL (August 1, 2022), available at: https://www.youtube.com/watch?v=xVyEgoMepeU&t.

described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

251.    To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '021 patent.

252.    As a result of Oracle's infringement of the '021 patent, Plaintiff has suffered monetary damages, and seek recovery 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.

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**COUNT VIII**
**INFRINGEMENT OF U.S. PATENT NO. 9,191,664**

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253.    Plaintiff references and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

254.    Oracle designs, makes, uses, sells, and/or offers for sale in the United States products for adaptive bitrate management.

255.    Oracle designs, makes, sells, offers to sell, imports, and/or uses the following products: Oracle Cloud Infrastructure (OCI) (including Media Services, Media Streams, and Media Flow functionality) (the "Oracle '664 Product(s)").

256.    One or more Oracle subsidiaries and/or affiliates use the Oracle '664 Products in regular business operations.

257.    The Oracle '664 Products accept and/or gather media data, which comprises both elements of audio and video information.

<div align="center">

COMPLAINT FOR PATENT INFRINGEMENT

</div>

*Introducing video streaming services from Oracle*, ORACLE DEVELOPERS YOUTUBE CHANNEL (July 28, 2022), available at: https://www.youtube.com/watch?v=ylRvTSiugO8.

258.    The Oracle '664 Products perform the step of receiving media data that includes both audio media data and video media data.  In this stage of the method, the computer system ingests or collects media data, which might come from various sources like a live broadcast, stored files, or a streaming service.  The data is then parsed or separated into audio and video components for further processing.

*Creating a Media Workflow*, ORACLE CLOUD INFRASTRUCTURE DOCUMENTATION (last visited Octobe 2023), available at: https://docs.oracle.com/en-us/iaas/Content/media-services/mediaflow/create-media-workflow.htm.

259.    The Oracle '664 Products take in an ideal session bitrate, which is the preferred data transfer rate for the media session.

260.    The Oracle '664 Products perform the step of receiving an optimal session bitrate. This step entails obtaining a pre-calculated or pre-defined bitrate that is considered optimal for the media session.  This optimal bitrate is a crucial parameter that affects the quality and efficiency of both audio and video transmission.



*Stream Video Using OCI Media Services*, ORACLE CLOUD INFRASTRUCTURE BLOG (December 1, 2022),  available  at:  https://blogs.oracle.com/cloud-infrastructure/post/stream-video-using-oci-media-services.

261. The Oracle '664 Products distribute the received ideal session bitrate between the audio and video media data, resulting in an optimal audio bitrate and an optimal video bitrate.

262. The Oracle '664 Products perform the step of allocating the optimal session bitrate between the audio media data and the video media data to produce an optimal audio bitrate and an optimal video bitrate. In this process, the total available optimal session bitrate is divided into two portions, aligning with the requirements for audio and video quality.

263. The Oracle '664 Products transform the audio media data using the determined optimal audio bitrate through a process of encoding.

264. The Oracle '664 Products perform the step of encoding the audio media data using the optimal audio bitrate. This process involves compressing the raw audio data according to a specific encoding algorithm while adhering to the predetermined optimal audio bitrate.

265. The Oracle '664 Products transmit the video media data with the use of the optimal video bitrate through encoding.
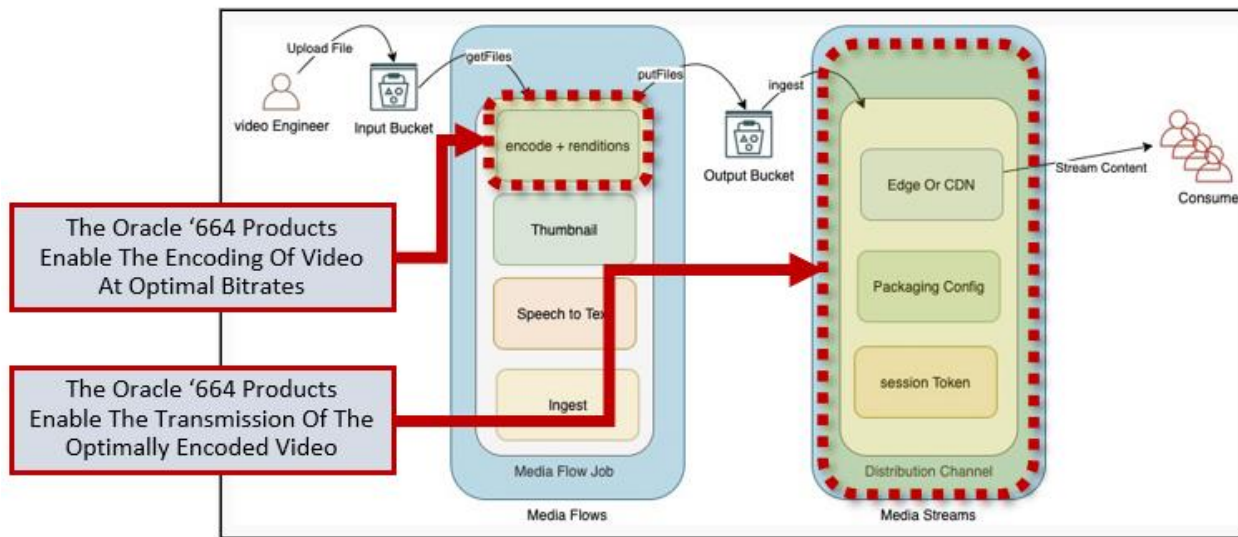


*Stream Video Using OCI Media Services*, ORACLE CLOUD INFRASTRUCTURE BLOG (December 1, 2022), available at: https://blogs.oracle.com/cloud-infrastructure/post/stream-video-using-oci-media-services.

266.     The Oracle '664 Products perform the step of encoding the video media data using the optimal video bitrate.  Similar to audio encoding, this step involves compressing raw video data into a specific format using the allocated optimal video bitrate.

267.     The Oracle '664 Products make the encoded audio media data and the encoded video media data available for dispatch to a terminal.

268.     The Oracle '664 Products perform the step of providing the encoded audio media data and the encoded video media data for transmittal to a terminal.  This final step involves packaging the encoded audio and video data into a suitable transmission format and sending it to the receiving terminal, such as a user's device or a downstream processing system.  The process may involve using specific transmission protocols and considering network conditions, latency requirements, and compatibility with the receiving device.

269.     Oracle has directly infringed and continues to directly infringe the '664 patent by, among other things, making, using, offering for sale, and/or selling technology comprising a method of adaptive bitrate management, including but not limited to the Oracle '664 Products.

270.     The Oracle '664 Products are available to businesses and individuals throughout the United States.

271.     The Oracle '664 Products are provided to businesses and individuals located in this District.

272.     By making, using, testing, offering for sale, and/or selling products and services comprising a method of adaptive bitrate management, including but not limited to the Oracle '664 Products, Oracle has injured Plaintiff and is liable to Plaintiff for directly infringing one or more claims of the '664 patent, including at least claim 9 pursuant to 35 U.S.C. § 271(a).

273. Oracle also indirectly infringes the '664 patent by actively inducing infringement under 35 U.S.C. § 271(b).

274. Oracle has had knowledge of the '664 patent since at least service of this Complaint or shortly thereafter, and Oracle knew of the '664 patent and knew of its infringement, including by way of this lawsuit.

275. Alternatively, Oracle has had knowledge of the '664 patent since at least November 17, 2015, based on its citation of the '664 patent and '664 patent family as relevant prior art in at least 15 patents that are assigned to and owned by Oracle, including:

- U.S. Patent No. 9,811,541 (granted November 07, 2017)
- U.S. Patent No. 9,864,759 (granted January 09, 2018)
- U.S. Patent No. 10,095,562 (granted October 09, 2018)
- U.S. Patent No. 9,588,733 (granted March 07, 2017)
- U.S. Patent No. 8,635,185 (granted January 21, 2014)
- U.S. Patent No. 8,732,191 (granted May 20, 2014)
- U.S. Patent No. 9,185,054 (granted November 10, 2015)
- U.S. Patent No. 9,110,715 (granted August 18, 2015)
- U.S. Patent No. 9,495,392 (granted November 15, 2016)
- U.S. Patent No. 9,378,045 (granted June 28, 2016)
- U.S. Patent No. 8,856,460 (granted October 07, 2014)
- U.S. Patent No. 8,856,352 (granted October 07, 2014)
- U.S. Patent No. 8,756,329 (granted June 17, 2014)
- U.S. Patent No. 9,092,460 (granted July 28, 2015)
- U.S. Patent No. 9,064,003 (granted June 23, 2015)

276. Oracle intended to induce patent infringement by third-party customers and users of the Oracle '664 Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. Oracle specifically intended and was aware that the normal and customary use of the accused products would infringe the '664 patent. Oracle performed the acts that constitute induced infringement,

and would induce actual infringement, with knowledge of the '664 patent and with the knowledge

that the induced acts would constitute infringement.  For example, Oracle provides the Oracle '664

Products that have the capability of operating in a manner that infringe one or more of the claims

of the '664 patent, including at least claim 9, and Oracle further provides documentation and

training materials that cause customers and end users of the Oracle '664 Products to utilize the

products in a manner that directly infringe one or more claims of the '664 patent.[21]  By providing

instruction and training to customers and end-users on how to use the Oracle '664 Products in a

manner that directly infringes one or more claims of the '664 patent, including at least claim 9,

Oracle specifically intended to induce infringement of the '664 patent.  Oracle engaged in such

inducement to promote the sales of the Oracle '664 Products, e.g., through Oracle user manuals,

product support, marketing materials, and training materials to actively induce the users of the

accused products to infringe the '664 patent.  Accordingly, Oracle has induced and continues to

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[21] *See e.g.*, *Introducing video streaming services from Oracle*, ORACLE DEVELOPERS YOUTUBE CHANNEL (July 28, 2022), available at: https://www.youtube.com/watch?v=ylRvTSiugO8; Oracle Media Streams Overview, ORACLE CLOUD INFRASTRUCTURE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/Content/media-services/mediastreams/media-streams-overview.htm; *Accelerate video operations with OCI Media Services*, ORACLE CLOUD INFRASTRUCTURE BLOG (July 20, 2022), available at: https://blogs.oracle.com/cloud-infrastructure/post/oracle-launches-oci-digital-media-services-to-accelerate-video-operations; *Oracle Media Services API Reference and Endpoints,* ORACLE CLOUD INFRASTRUCTURE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/api/#/en/dms/20211101/; *Stream your video in Oracle Cloud using Media Services*, ORACLE LIVELABS WORKSHOP (last visited October 2023), available at: https://apexapps.oracle.com/pls/apex/dbpm/r/livelabs/view-workshop?wid=3508; *Stream Video Using OCI Media Services*, ORACLE CLOUD INFRASTRUCTURE BLOG (December 1, 2022), available at: https://blogs.oracle.com/cloud-infrastructure/post/stream-video-using-oci-media-services; *Oracle Overview of Media Flow,* ORACLE CLOUD INFRASTRUCTURE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/Content/media-services/mediaflow/media-flow-overview.htm; *Workshop: Deploying OCI Streaming Service*, ORACLE DEVELOPERS YOUTUBE CHANNEL (October 12, 2022), available at: https://www.youtube.com/watch?v=bXWvZxgK1ow; and *Overview of Media Services*, ORACLE CLOUD INFRASTRUCTURE DOCUMENTATION (last visited October 2023), available at: https://docs.oracle.com/en-us/iaas/Content/media-services/overview.htm.

COMPLAINT FOR PATENT INFRINGEMENT

induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '664 patent, knowing that such use constitutes infringement of the '664 patent.

277.    The '664 patent is well-known within the industry as demonstrated by multiple citations to the '664 patent in published patents and patent applications assigned to technology companies and academic institutions.  Oracle is utilizing the technology claimed in the '664 patent without paying a reasonable royalty.  Oracle is infringing the '664 patent in a manner best described as willful, wanton, malicious, in bad faith, deliberate, consciously wrongful, flagrant, or characteristic of a pirate.

278.    To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '664 patent.

279.    As a result of Oracle's infringement of the '664 patent, Plaintiff has suffered monetary damages, and seeks recovery 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 OptiMorphix, Inc. 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 '314, '273, '418, '871, '169, '901, '021, and '664 patents;

B.    An award of damages resulting from Oracle's acts of infringement in accordance with 35 U.S.C. § 284;

C.    A judgment and order finding that Oracle's infringement was willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, flagrant, or

characteristic of a pirate within the meaning of 35 U.S.C. § 284 and awarding to Plaintiff enhanced damages;

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

E.      Any and all other relief to which Plaintiff may show themselves to be entitled.

## JURY TRIAL DEMANDED

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

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Dated:  November 1, 2023

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