IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

ACQIS LLC, a Texas limited liability company, Plaintiff, v. ZT GROUP INT'L, INC. dba ZT SYSTEMS, a New Jersey corporation, Defendant.	Civil Action No. 6:23-cv-00881 **JURY TRIAL DEMANDED**

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff ACQIS LLC ("Plaintiff" or "ACQIS"), by its attorneys, hereby alleges patent infringement against Defendant ZT Group Int'l, Inc. ("Defendant" or "ZT Systems"), as follows:

INTRODUCTION

1. This is an action for patent infringement under the United States Patent Laws, 35 U.S.C. § 1 *et seq*. Beginning in the late 1990s, Dr. William Chu founded ACQIS and invented a variety of pioneering computer technologies that employed serial transmission along low voltage differential signal (LVDS) channels to dramatically increase the speed at which data can be transmitted while also reducing power consumption and noise. Dr. Chu's inventions have become foundational in the computer industry, and are found in a variety of data transmission systems, including PCI Express (PCIe) and/or USB 3.x[1] transactions.

[1] As used herein, "USB 3.x" refers to USB 3.0 and subsequent versions, including USB 3.1, USB 3.2, and any other subsequent versions.

2. ZT Systems has infringed the following patents owned by ACQIS: U.S. Patent Nos. 9,529,768 ("'768 patent"), 9,703,750 ("'750 patent"), 8,977,797 ("'797 patent"), RE44,654 ("'654 patent"), RE46,947 ("'947 patent"), and 8,234,436 ("'436 patent") (collectively, the "ACQIS Patents"). Copies of the ACQIS Patents are attached to this Complaint as Exhibits 1-6.

3. Specifically, ZT Systems has directly infringed the ACQIS Patents through: (1) the manufacture, use, offering to sale, and/or sale in the United States, and/or the importation into the United States, of infringing computer products; (2) the practice of claimed methods of the ACQIS Patents by manufacturing, using and/or testing computer products in the United States; and (3) the importation into the United States of computer products made abroad using ACQIS's patented processes.

4. ACQIS seeks damages and other relief for Defendant's infringement of the ACQIS Patents. ACQIS is entitled to past damages because, without limitation, it has provided actual notice to Defendant. It is also entitled to past damages for its method claims, which do not require marking.

THE PARTIES AND RELATED ENTITIES

5. Plaintiff ACQIS LLC, is a limited liability company organized and existing under the laws of the State of Texas, with offices at 411 Interchange Street, McKinney, Texas 75071. A related entity, ACQIS Technology, Inc., is a corporation organized under the laws of the State of Delaware, having its principal place of business at 1503 Grant Road, Suite 100, Mountain View, California 94040. ACQIS LLC is operated from California, where its President, Dr. William Chu, resides. Dr. Chu is also the Chief Executive Officer of ACQIS Technology, Inc.

6. Defendant ZT Group Int'l, Inc. ("ZT Systems") is a New Jersey corporation with locations around the world including at 12301 Research Blvd., Bldg. IV, Suite 300, Austin, Texas

78759[2] and plans to build a major manufacturing site in Georgetown, Texas.[3] ZT Systems has sold infringing servers to third parties in the United States, and has shipped infringing servers to and/or within the United States.

7. According to ZT Systems' website, "ZT Systems is a leading provider of complex compute, storage, and accelerator solutions for the world's leading cloud and telecom service providers. With comprehensive engineering expertise, global high-volume manufacturing capabilities, and strong partnerships with leading technology suppliers, we can address the most demanding requirements quickly and efficiently. No matter the challenge, we're committed to achieving error-free deployment, on time and around the world."[4] Moreover, ZT Systems' vision is to "[c]reate the foundation for cloud-based technology that helps people all over the world connect, learn, play, explore, and innovate."[5] According to ZT, since it was founded in 1994, it has provided servers, but in 2004 their focus shifted to data center servers.[6] In 2010, "ZT provided a mature datacenter server offering including full-rack solution design and integration," and then in 2013, "ZT became recognized as a key partner to many of the world's largest cloud service providers."[7] ZT Systems' website further states that, "[t]oday, we ship hundreds of thousands of servers annually, with sustained year-over-year growth."[8]

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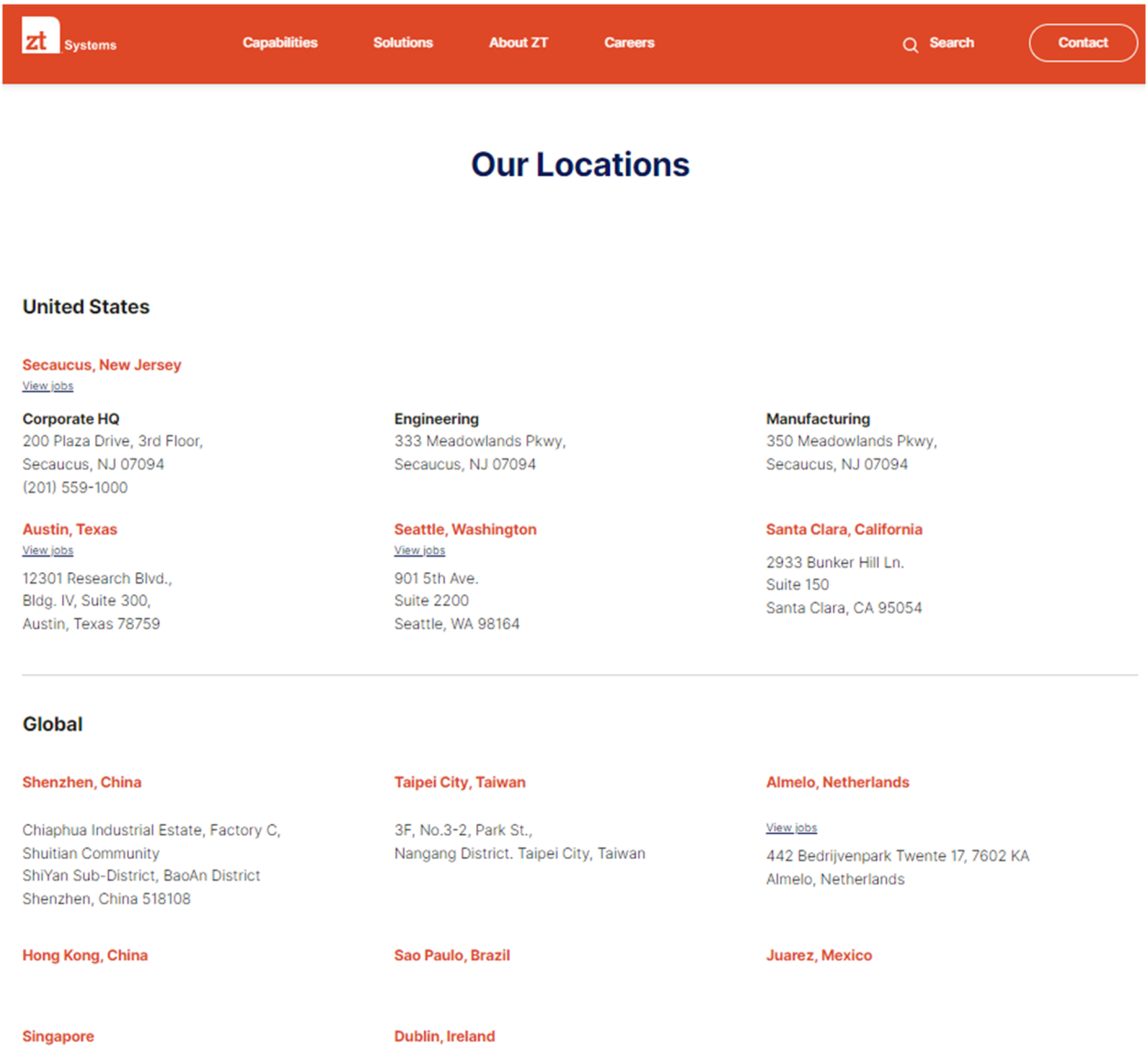
[2] ZT Systems website, Contact – Our Locations, https://ztsystems.com/contact/.
[3] KXAN News website, ZT Systems bringing new site with 1,500 jobs to Georgetown, https://www.kxan.com/news/local/georgetown/zt-systems-bringing-new-site-with-1500-jobs-to-georgetown/; ZT Systems website, ZT Systems Unveils Future Cloud Computing Manufacturing Site in Greater Austin, Texas Area, Oct. 23, 2023, https://ztsystems.com/zt-systems-unveils-future-cloud-computing-manufacturing-site-in-greater-austin-texas-area/ (announcing that ZT Systems plans to open a manufacturing facility in Georgetown, TX in 2024).
[4] ZT Systems website, About ZT, https://ztsystems.com/about-zt/.
[5] *Id.*
[6] *Id.*
[7] *Id.*
[8] *Id.*

8. As ZT Systems states on its website, "[w]e design, build, and deliver the cloud-enabling solutions service providers rely on. In collaboration with customers, we develop high-quality, purpose-built server solutions that support a complex global infrastructure. ZT Systems is at the leading edge of the digital world—leveraging knowledge, partnership, and the latest technologies to custom-build solutions for our customers."[9] Among other things, "ZT Systems combines standard components with custom design to ensure efficient server solutions optimized for your workloads. With deep experience designing equipment for global hyperscale environments, our expertise enables us to deliver solutions optimized for performance and efficiency running the most advanced compute workloads."[10] According to ZT Systems, they "help build the foundation for AI in cloud, edge, and local IT environments with platforms powered by the latest GPUs, FPGAs and ASICs. Featuring advanced technology from partners including NVIDIA, Intel, and AMD, ZT solutions enable powerful next-generation HPC, AI, and machine learning tools that help solve the world's most challenging problems."[11] This includes rack-based server solutions: "Ideal for web scale customers with global operations, ZT integrated solutions leverage our rack-level capabilities for workload analysis, thermal testing, burn-in, quality assurance, and deployment. Rack-level optimizations can include custom power and network cable handling, and racks are shipped in specialized, shock-resistant crates to data centers worldwide."[12]

9. ZT Systems' website contains a list of its global and United States locations, titled "Our Locations"[13]:

[9] ZT Systems website, Solutions, https://ztsystems.com/solutions/.
[10] *Id.*
[11] *Id.*
[12] *Id.*
[13] ZT Systems website, Contact – Our Locations, https://ztsystems.com/contact/.



10. ZT Systems engages in sales of accused servers to customers in the United States.[14]

11. Based on information and belief, ZT Systems also engages in manufacturing of accused servers in the United States as well as importation of accused servers to the United States that were manufactured outside of the United States.[15]

[14] ZT Systems website, About ZT, https://ztsystems.com/about-zt/.
[15] *Id.*; ZT Systems website, Contact – Our Locations, https://ztsystems.com/contact/; KXAN News website, ZT Systems bringing new site with 1,500 jobs to Georgetown,

12. On information and belief, ZT Systems has shipped infringing servers to the United States from its facilities abroad to its United States facilities and third parties.

13. For example, based on public information, on June 16, 2018, ZT Systems made a shipment from Rotterdam, Netherlands to New York City, New York totaling over 19,000 pounds, labeled "SERVER RACKS: HS:850440."[16] Upon information and belief, these shipments included infringing XPO200 servers.

14. For example, based on public information, on May 28, 2019, ZT Systems made a shipment from Rotterdam, Netherlands to New York City, New York totaling over 39,000 pounds, labeled "SERVER RACKS HS:847330 732690 850440."[17] Upon information and belief, these shipments included infringing XPO200 servers.

15. For example, based upon public records, in December 2019, ZT Systems made two shipments from Rotterdam, Netherlands to New York, New York totaling nearly 76,000 pounds, labeled "SERVER RACKS HS:847330."[18] Upon information and belief, these shipments included infringing XPO200 servers."

JURISDICTION AND VENUE

16. This is an action for patent infringement under the United States patent laws, 35 U.S.C. § 101 *et seq*.

17. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

https://www.kxan.com/news/local/georgetown/zt-systems-bringing-new-site-with-1500-jobs-to-georgetown/.

[16] U.S. Import Bill of Lading No. EXDO6490082162.

[17] U.S. Import Bill of Lading No. EXDO6490084389.

[18] U.S. Import Bills of Lading Nos. EXDO6490087191, EXDO6490087060.

18. This Court has personal jurisdiction over the Defendant consistent with the requirements of the Due Process Clause of the United States Constitution and the Texas Long Arm Statute.

19. On information and belief, ZT Systems has purposefully manufactured and/or distributed server products that infringe the ACQIS Patents, or that were made abroad using patented processes claimed in the ACQIS Patents, through established distribution channels with the expectation that those products would be sold in the United States, State of Texas, and in this District.

20. Publicly available import data indicates that ZT Systems sells and imports servers into the United States. Data from Import Genius indicates that, in the past five years, ZT Systems has acted as supplier for at least 38 shipments imported into the United States, totaling over 180 containers and over 1.6 million pounds.[19]

21. Further, Defendant has (itself and/or through the activities of subsidiaries, affiliates, or intermediaries) committed acts of patent infringement in the United States, State of Texas and this District, including by making, using, offering to sell, and/or selling infringing server products in the United States, State of Texas and this District; and importing infringing server products and/or server products made abroad using ACQIS's patented processes into the United States for sale in the State of Texas and this District.

22. Defendant ZT Systems controls a production and distribution chain with respect to the manufacture, use, offering to sell, and/or sale of infringing computer products and with respect to the importation into the United States of infringing server products and of server products made abroad using patented processes claimed in the ACQIS Patents.

[19] U.S. Import Records, available from Import Genius.

23. Accordingly, ZT Systems has established minimum contacts within Texas and purposefully availed itself of the benefits of Texas, and the exercise of personal jurisdiction over ZT Systems would not offend traditional notions of fair play and substantial justice. In addition, or in the alternative, this Court has personal jurisdiction over ZT Systems pursuant to Federal Rule of Civil Procedure 4(k)(2). *See, e.g., ACQIS LLC v. Lenovo Group Ltd. et al.*, 572 F. Supp. 3d 291, 302-307 (W.D. Tex. Nov. 16, 2021) (denying motion to dismiss for lack of personal jurisdiction as to served defendants).

24. Venue is proper in this District pursuant to 28 U.S.C. §§ 1391(b), (c), (d) and 1400(b).

25. ZT Systems has regular and established physical presences in this District and this State, including, but not limited to, ownership of or control over property, inventory, or infrastructure. According to its website, ZT Systems maintains an established place of business within this District located at 12301 Research Blvd., Bldg. IV, Suite 300, Austin, Texas 78759 and has announced plans to build a major manufacturing site in Georgetown, Texas.

26. On information and belief, ZT Systems has (itself and/or through the activities of subsidiaries, affiliates, or intermediaries) committed acts of patent infringement in the United States, State of Texas and this District, including by making, using, offering to sell, and/or selling infringing computer server products in the United States, State of Texas and this District; importing infringing computer server products and/or computer server products made abroad using ACQIS's patented processes into the United States for sale in the State of Texas and this District.

27. Venue is also appropriate because the patents asserted in this case have been previously asserted in cases before this Court. Certain of the patents will be the subject of a trial scheduled to be held in this District in March 2024 (*ACQIS, LLC v. Asus*, No. 6:2020-cv-966), and are also

the subject of a recently-filed suit that is proceeding in this District (*ACQIS, LLC v. Quanta Computer, Inc.*, 6:2023-cv-265). It would serve the interests of judicial efficiency for this case to be litigated in this district. *See, e.g., ACQIS LLC v. MiTac Computing Tech. Corp.*, No. W-20-cv-00962-ADA, 2021 U.S. Dist. LEXIS 197938, 2021 WL 4805431 (W.D. Tex., Oct. 14, 2021) (describing four pending cases and denying motion to transfer venue in prior case litigating same patent family).

FACTUAL BACKGROUND

Dr. Chu and the ACQIS Patents

28. Dr. William Chu has been a prolific innovator in the computing industry since the 1970s.

29. In 1976, Dr. Chu received his Ph.D. in Electrical Engineering from the University of California, Berkeley. Dr. Chu then began working in semiconductor design for American Microsystems, Inc. from 1976 to 1977, and then for Zilog, Inc. from 1977 to 1982.

30. In 1982, Dr. Chu founded Verticom, Inc., which developed innovative technologies relating to video transmission over telephone lines. Verticom also developed graphics products for the PC computer-aided design (CAD) market. Verticom's success resulted in its stock being listed on the NASDAQ exchange in 1987. In 1988, Verticom was acquired by Western Digital Imaging, Inc.

31. Dr. Chu served as Vice President of Engineering for Western Digital from 1988 to 1991, overseeing a development team in the desktop and portable graphics chip division. In the course of his work at Western Digital, Dr. Chu in 1988 started the company's portable graphics chip business, which became #1 in the portable graphics chip market by 1991. Dr. Chu also led Western Digital to achieve the #1 market share in the PC graphics market in 1990.

32. After Western Digital, Dr. Chu worked for Acumos, Inc. from 1991 to 1992 as a Vice President managing engineering for computer graphics chip development. Acumos was acquired by Cirrus Logic, Inc. in 1992.

33. Dr. Chu then worked for Cirrus Logic from 1992 to 1997, first as a General Manager in the Desktop Graphics Division and later as Co-President of the Graphics Chip Business Unit. During Dr. Chu's time at Cirrus Logic, the company achieved #1 market share in the PC graphics chip market.

34. In 1998, Dr. Chu founded ACQIS Technology, Inc. to pursue his vision of developing a small, portable computer module that could be interchangeably connected with a variety of different peripheral consoles. In the course of this development effort, Dr. Chu recognized the need for a better interconnection between the core computing module and a peripheral console. Such interconnections traditionally conveyed peripheral component interconnect (PCI) bus transactions in parallel using a large number of signal channels and connector pins. This made it difficult to employ LVDS channels, which are more "cable friendly," consume less power, and generate less noise. Dr. Chu wanted to develop an interconnection system that was scalable, used connectors with low pin counts, was power-efficient, high performing, and easily extendible for future computing needs and technologies. This development work resulted in a large family of patents now owned by ACQIS, which disclose and claim a variety of pioneering inventions relating to improved, high-performance and low-power consuming interconnection technologies for computer modules.

35. After several decades in the industry, Dr. Chu is now a named inventor of over forty U.S. Patents.

36. Among the patent portfolio covering Dr. Chu's inventions and owned by ACQIS are the ACQIS Patents asserted in this case.

37. The '768 patent, entitled "Computer System Including CPU or Peripheral Bridge Directly Connected to a Low Voltage Differential Signal Channel that Communicates Serial Bits of a Peripheral Component Interconnect Bus Transaction in Opposite Directions," was duly and legally issued on December 27, 2016, from a patent application filed March 13, 2014, with William W.Y. Chu as the sole named inventor. The '768 patent claims priority to U.S. Provisional Patent Application No. 60/134,122, filed on May 14, 1999.

38. The '750 patent, entitled "Computer System Including CPU or Peripheral Bridge Directly Connected to a Low Voltage Differential Signal Channel that Communicates Serial Bits of a Peripheral Component Interconnect Bus Transaction in Opposite Directions," was duly and legally issued on July 11, 2017, from a patent application filed October 9, 2014, with William W.Y. Chu as the sole named inventor. The '750 patent claims priority to U.S. Provisional Patent Application No. 60/134,122, filed on May 14, 1999.

39. The '797 patent, entitled "Method of Improving Peripheral Component Interface Communications Utilizing a Low Voltage Differential Signal Channel," was duly and legally issued on March 10, 2015, from a patent application filed October 10, 2012, with William W.Y. Chu as the sole named inventor. The '797 patent claims priority to U.S. Provisional Patent Application No. 60/134,122, filed on May 14, 1999.

40. The '654 patent, entitled "Data Security Method and Device for Computer Modules," was duly and legally issued on December 17, 2013, from a reissue application filed October 10, 2012, with William W.Y. Chu as the sole named inventor. The '654 patent is a reissue of U.S. Patent No. 6,643,777, which issued on November 4, 2003, from a patent application filed May 14,

1999. The '654 patent claims priority to U.S. Patent Application No. 09/312,199, filed on May 14, 1999.

41. The '947 patent, entitled "Data Security Method and Device for Computer Modules," was duly and legally issued on July 10, 2018, from a reissue application filed November 22, 2013, with William W. Y. Chu as the sole named inventor. The '947 patent is a reissue of U.S. Patent No. 6,643,777, which issued on November 4, 2003, from a patent application filed May 14, 1999. The '947 patent claims priority to U.S. Patent Application No. 09/312,199, filed on May 14, 1999.

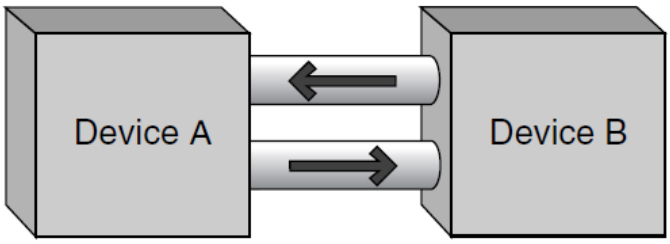
42. The '436 patent, entitled "Computer System Including Peripheral Bridge to Communicate Serial Bits of Peripheral Component Interconnect Bus Transaction and Low Voltage Differential Signal Channel to Convey the Serial Bits," was duly and legally issued on July 31, 2012, from a continuation of application No. 12/504,534, filed on Jul. 16, 2009, with William W.Y. Chu as the sole named inventor. The '797 patent claims priority to U.S. Provisional Patent Application No. 60/134,122, filed on May 14, 1999.

43. The inventions claimed in the ACQIS Patents enable computers to operate faster with better efficiency through faster interconnections including between the core computing power modules and any connected consoles.

44. The claims in the ACQIS Patents generally relate to computers and computer systems that employ CPUs coupled to LVDS channels that convey various types of data (*e.g.*, PCI bus transactions, USB 3.x data, and/or digital video data) in a serial bit stream using pairs of unidirectional channels to convey the data in opposite directions.

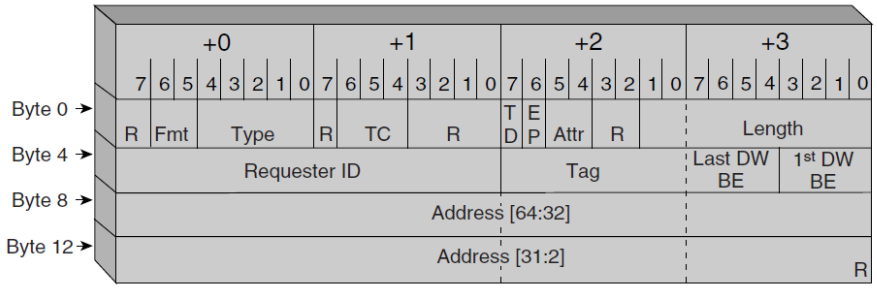
45. Over the years, Dr. Chu's inventive developments have become more and more widely used in computing technologies. One prime example is the computing industry's adoption of PCI Express, which post-dates Dr. Chu's inventions but embodies Dr. Chu's patented interconnection

invention by using "high speed, low voltage, differential serial pathway for two devices … to communicate simultaneously by implementing dual unidirectional paths between two devices[.]"



See Introduction to PCI Express – A Hardware and Software Developers Guide, Intel Press (2003), at 1-2 ("There are certain times in the evolution of technology that serve as inflection points that forever change the course of events. For the computing sector and communications, the adoption of PCI Express, a groundbreaking new general input/output architecture, will serve as one of these inflection points.").

46. PCI Express connections transmit data packets known as transaction layer packets (TLP) that include data bits, address bits, and byte enable (BE) information bits.



Id. at 93-114.

47. PCI Express "establishes a unique divergence from historical PCI evolutions through a layered architecture improving serviceability and scalability as well as easing software transitions through backward compatibility."[20] The compatibility of PCI Express with PCI can be

[20] Adam H. Wilen, Justin P. Schade, Ron Thornburg. INTRODUCTION TO PCI EXPRESS - A HARDWARE AND SOFTWARE DEVELOPER'S GUIDE, Intel Press, 2003, pages 51-52.

further explained as follows: "PCI Express employs the same usage model and load-store communication model as PCI and PCI-X. It supports familiar transactions such as memory read/write, IO read/write and configuration read/write transactions. The memory, IO, and configuration address space model is the same as PCI and PCI-X address spaces. By maintaining the address space model, existing OS and driver software will run in a PCI Express system without any modifications. In other words, PCI Express is software backward compatible with PCI and PCI-X systems. In fact, a PCI Express system will boot an existing OS with no changes to current drivers and application programs. Even PCI/ACPI power management software will still run."[21]

48. In sum, PCI Express connections are LVDS channels that convey data bits, address bits, and byte enable information bits of a PCI bus transaction in a serial bit stream using pairs of unidirectional, differential signal lanes to convey the information in opposite directions allowing the connection to be scalable and dramatically reducing the pin-count required for connectors, as well as other benefits. "Currently PCI Express defines the following configuration of serial links: x1, x2, x4, x8, x12, x16, and x32. … An x2 configuration indicates two serial paths to and from a device[.]"

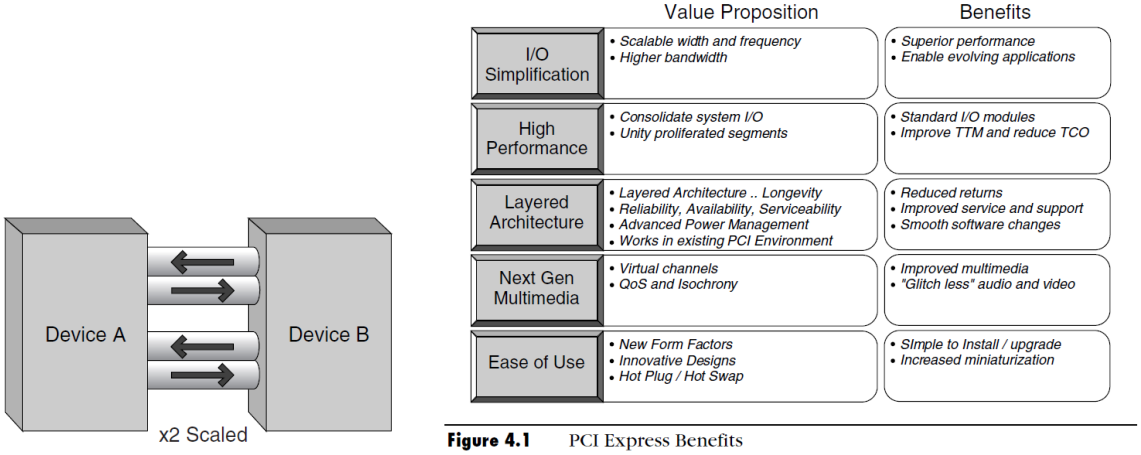


Figure 4.1 PCI Express Benefits

[21] Ravi Budruk, et al., PCI EXPRESS SYSTEM ARCHITECTURE, 400, (MindShare Inc., 2004) at 11.

Id. at 3, 50.

49. Another example of a computer-to-peripheral interconnection that embodies Dr. Chu's patented invention is the USB 3.x connection. The "Super Speed" USB 3.0 architecture uses at least two pairs of unidirectional, point-to-point differential signal paths. Each pair includes a transmit path and a receiving path, thus transmitting the USB data packet information in opposite directions.

3.1.4 USB 3.0 Architecture Summary

USB 3.0 is a dual-bus architecture that incorporates USB 2.0 and a SuperSpeed bus. Table 3-1 summarizes the key architectural differences between SuperSpeed USB and USB 2.0.

Table 3-1. Comparing SuperSpeed to USB 2.0

Characteristic	SuperSpeed USB	USB 2.0
Data Rate	SuperSpeed (5.0 Gbps)	low-speed (1.5 Mbps), full-speed (12 Mbps), and high-speed (480 Mbps)
Data Interface	Dual-simplex, four-wire differential signaling separate from USB 2.0 signaling Simultaneous bi-directional data flows	Half-duplex two-wire differential signaling Unidirectional data flow with negotiated directional bus transitions
Cable signal count	Six: Four for SuperSpeed data path Two for non-SuperSpeed data path	Two: Two for low-speed/full-speed/high-speed data path
Bus transaction protocol	Host directed, asynchronous traffic flow Packet traffic is explicitly routed	Host directed, polled traffic flow Packet traffic is broadcast to all devices.

Universal Serial Bus 3.0 Specification, Rev. 1.0 (Nov. 12, 2008), at 3.1 to 3.5. USB 3.x ports operate in conformance with all USB protocols, including USB 2.0 protocols and USB 3.0 or later protocols, which are backward compatible with the USB 2.0 protocol. In sum, USB 3.x connections are LVDS channels using two unidirectional, differential signal pairs that transmit USB protocol data packets in opposite directions.

50. The Direct Media Interface ("DMI") is similar to PCIe and implements at least four serial lanes that all use differential signaling constituting two transmit lanes and two receive lanes and, therefore, transmit data in opposite directions. *See* https://www.intel.com/content/dam/www/public/us/en/documents/white-papers/ia-introduction-basics-paper.pdf; *see also* https://en.wikipedia.org/wiki/Direct_Media_Interface ("DMI shares

many characteristics with PCI Express, using multiple lanes and differential signaling to form a point-to-point link.").

51. The On-Package Interface (OPI) is like DMI but is used when a CPU and system controller are integrated into a single system-on-a-chip ("SoC"). *See, e.g.*, https://web.archive.org/web/20170106002415/https://www.anandtech.com/show/10959/intel-launches-7th-generation-kaby-lake-i7-7700k-i5-7600k-i3-7350k/5.

52. Additional interfaces that employ LVDS channels include, but are not limited to, DisplayPort[22], Embedded DisplayPort ("eDP")[23], Serial-Attached SCSI ("SAS")[24], and Serial ATA or Serial AT Attachment ("SATA")[25]. Other protocols that use LVDS channels are USB4, Thunderbolt 3, and Thunderbolt 4. Since USB4, Thunderbolt 3, and Thunderbolt 4 use USB-Type C connectors, at least two low voltage differential signaling pairs in opposite directions are used to transfer PCI Express, DisplayPort, and/or USB packets.[26] Moreover, Thunderbolt controllers use PCI Express.[27] USB4 offers display, data, and load/store functionality over a single USB

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[22] Tektonix, THE BASICS OF SERIAL DATA COMPLIANCE AND VALIDATION MEASUREMENTS – PRIMER, page 9.

[23] eDP is a display panel interface standard that defines the signaling interface between CPUs/GPUs and integrated displays. It is based on the existing DisplayPort standard. Essentially, it is an embedded version of the DisplayPort standard oriented toward applications, such as notebooks and All-In-One PCs. Like DisplayPort, it consists of the Main Link, Auxiliary channel, and an optional Hot-Plug Detect signal. *See* https://edc.intel.com/content/www/us/en/design/ipla/software-development-platforms/client/platforms/alder-lake-desktop/12th-generation-intel-core-processors-datasheet-volume-1-of-2/003/embedded-displayport-edp/.

[24] HP. *Serial ATA and Serial Attached SCSI technologies*. TECHNOLOGY BRIEF, 2003, page 5. Available at http://h10032.www1.hp.com/ctg/Manual/c00256909.pdf.

[25] HP. *Serial ATA and Serial Attached SCSI technologies*. TECHNOLOGY BRIEF, 2003, page 5. Available at http://h10032.www1.hp.com/ctg/Manual/c00256909.pdf; Tektonix, THE BASICS OF SERIAL DATA COMPLIANCE AND VALIDATION MEASUREMENTS – PRIMER, page 9.

[26] Brad Saunders. USB Type-C System Overview: Enabling connections for data, display, and power. USB Developer Days 2019 – Taipei, Taiwan, November 19, 2019, pag3 7. Available at https://www.usb.org/sites/default/files/D1T1-2%20-%20USB%20Type-C%20System%20Overview.pdf.

[27] *See* Intel. Thunderbolt Technology: The Transformational PC I/O. Technology Brief, page 3.

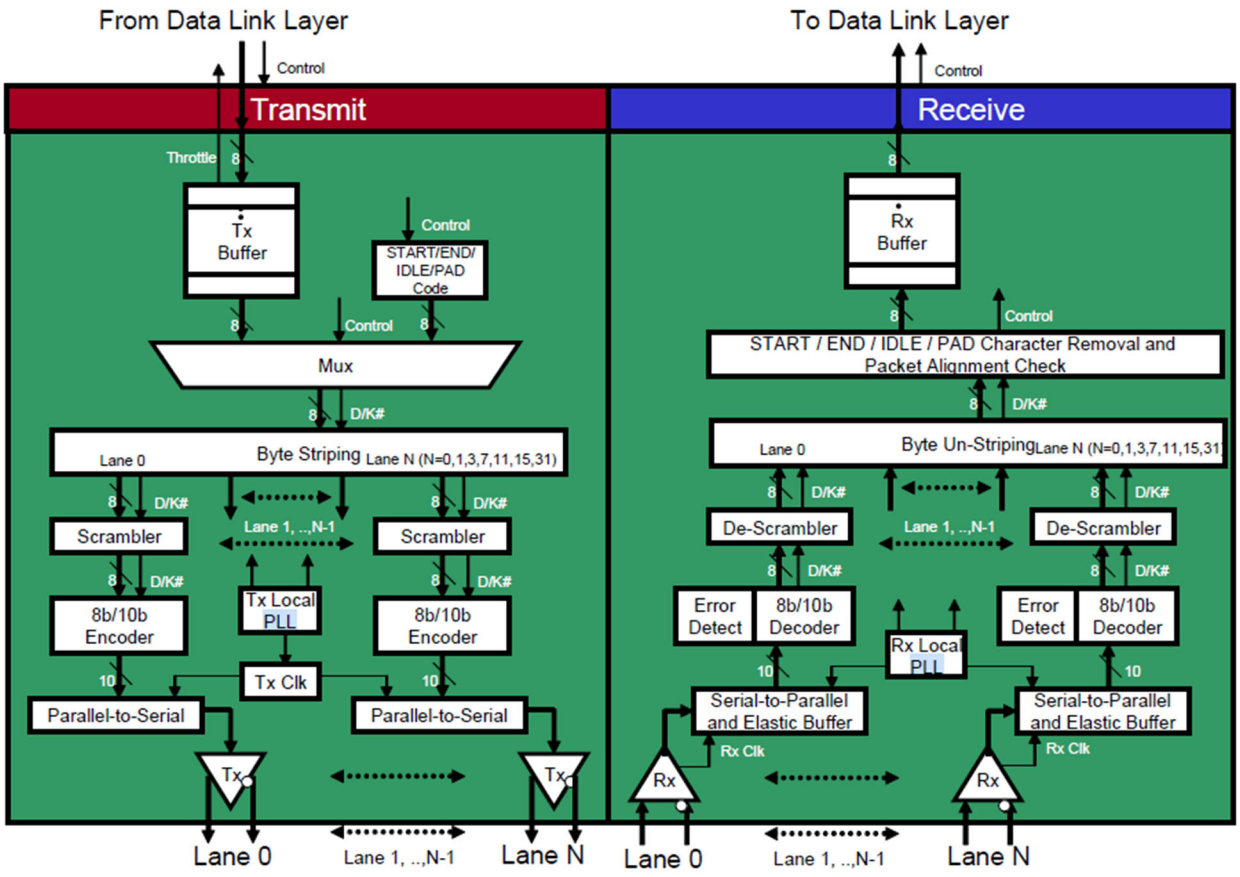
Type-C connector and retains compatibility with the existing ecosystem of USB and Thunderbolt products.[28] USB4 (formerly known as Thunderbolt 3 protocol) can tunnel USB 3.x, PCIe, and DisplayPort protocols. It uses up to two lanes, each consisting of two differential signal pairs (Tx/Rx), and is used for tunneled protocol and control traffic.[29]

53. The physical layer of PCI Express includes PLL circuitry. *See* PCI Express Base Specification Revision 3.0, Section 1.5.3, page 49 (physical Layer "includes all circuitry for interface operation, including driver and input buffers, parallel-to-serial and serial-to-parallel conversion, PLL(s), impedance matching circuitry" as well as "logical functions related to interface initialization and maintenance"). The figure below also shows the use of PLL circuitry:

Available at http://www.123seminarsonly.com/Seminar-Reports/008/51703485-intel-thunderbolt-technology.pdf.
See also Jeff Bake, Dinesh Jain, and Jacob Ontiveros. Thunderbolt™ 3 Technology and USB-C. Intel Developer Forum (IDF15), page 27. Available at https://www.thunderbolttechnology.net/sites/default/files/Thunderbolt3USBC-IDFf.pdf

[28] Universal Serial Bus 4 (USB4) Specification, Version 1.0, August 2019, page 1.

[29] https://www.usb.org/sites/default/files/D1T1-3%20-%20USB4%20System%20Overview.pdf at 14.



Ravi Budruk, *et al.*, PCI EXPRESS SYSTEM ARCHITECTURE, 454, (MindShare Inc., 2004), page 401.

54. Each claim of the ACQIS Patents is a patentable, valid and enforceable invention that is novel and non-obvious over the prior art.

55. ACQIS has not authorized or licensed ZT Systems to practice any of the inventions claimed in the ACQIS Patents.

ZT Systems' Infringing Products

56. ZT Systems is a global leader in the computer server market. ZT Systems makes and sells computer servers. On information and belief, ZT Systems imports infringing computer servers, as well as computer servers made using infringing processes, into the United States and into this judicial District, through established distribution channels with the expectation that those products would be sold in the United States, State of Texas and this District.

57. On information and belief, ZT Systems' sale of servers generates millions, and possibly billions, of dollars in revenue every year.

58. According to ZT Systems' website, its "XPO200 3U PCIe Expansion Systems is designed to deliver outstanding flexibility, performance, and value in a range of data center applications including mission-critical and hybrid cloud workloads, real-time analytics, machine learning, and artificial intelligence. ZT Systems XPO200 Server solutions are based on Microsoft's Project Olympus building blocks, which provide a powerful foundation for server workloads including compute, cold storage, performance storage, and AI."[30]

59. ZT Systems has directly infringed one or more claims of each of the ACQIS Patents under at least 35 U.S.C. §§ 271(a) and (g), by making, using, offering to sell, and/or selling within the United States, and/or importing into the United States, server products that embody the claimed inventions of Dr. Chu, and/or by importing into, and/or using, offering to sell, and/or selling in, the United States computer products that were made abroad using patented processes claimed in the ACQIS Patents.

60. ZT Systems makes, uses, imports, sells, and/or offers to sell a variety of server products in the United States that infringe one or more of the claims in the ACQIS Patents, and/or imports into, and/or uses, offers to sell, and/or sells in, the United States server products that were made abroad using patented processes claimed in the ACQIS Patents including, without limitation, servers sold under the brand names XPO200 Server Solutions, XPO200 3U PCIe Expansion System, XPO200 3UN PCIe, and the XPO200 3UA PCIe. These products are collectively referred to as the "Accused ZT Products."

[30] ZT Solutions website – XPO200 Server Solutions, https://ztsystems.com/solutions/xpo200-server-solutions/.

61. On information and belief, ZT Systems manufactures and tests at least certain of the Accused ZT Products abroad and uses, offers to sell, and/or sells such products in the United States, and/or imports such products into the United States.

62. On information and belief, at least certain of the Accused ZT Products that ZT Systems imports into the United States are manufactured outside the United States using one or more processes claimed in the ACQIS Patents.

63. The Accused ZT Products include products made, used, offered for sale, sold within the United States, and/or imported into the United States, at least since ACQIS provided ZT Systems actual notice of its infringement on or around July 17, 2018.

64. The Accused ZT Products also include products made using the processes claimed in the ACQIS Patents and imported into the United States within the six years preceding the date of this Complaint.

65. The Accused ZT Products also include products that are used to perform one or more methods claimed in the ACQIS Patents within the six years preceding the date of this Complaint.

The Accused ZT Products

66. On information and belief, all of the Accused ZT Products are configured and operate in substantially the same way as explained below using the XPO200 3UN PCIe Expansion System ("3UN PCIe") server as an example for illustrative purposes.

67. The 3UN PCIe is a computer.

https://ztsystems.com/solutions/xpo200-server-solutions/.

68. The 3UN PCIe uses up to two Intel® Xeon® processors, which have integrated interface controllers on a single chip, such as to drive the PCIe channels connected to the processor.

Table 2: Supported System Configuration Options

Feature	Qty	Description
Chassis	1	3U, 19" EIA310-D Compliant supporting Project Olympus PMDU connections
Motherboard	1	Mount Olympus 2-Socket Intel Xeon Scalable Motherboard (Purley)
Processor	2	Intel® Xeon® Platinum 8168 processor (24 core, 2.7 Ghz, 205W)
Memory	12	32GB DDR4, DR, 2667 R-DIMMs; Total System Memory: 384GB
PCIe Riser 3 & 5	2	4-Slot Active PCIe x16 Riser Card with 96-lane PCIe Switch
PCIe Riser 4	1	5-Slot Active PCIe x16 Riser Card with 96-lane PCIe Switch
GPU Card	12	Nvidia Tesla T4 GPU, LP, 75W PCIe x16 Card
Ethernet	1	10G Single port SFP+ PCIe 2.0 x8 5GT/s
HDD/SSD	1	M.2 960GB NVMe SSD, PCIe x4 110mm (sourced from CPU)
Security	1	TPM2.0 SPI Module
System Fans	6	60mmx56mm Dual Rotor Fans
Power Supply	3	Project Olympus 1020W 3-Phase, non-LES PSU
Power Distribution	1	PDB and Cable Harnesses to support 12V Power to MB, Risers, PCIe Cards, and System Fans

https://www.opencompute.org/documents/3u-server-intel-open-compute-specification-190718-pdf-1 at p. 10.

69. The 3UN PCIe includes a variety of connectors that can couple the CPU to a variety of consoles, including USB 3.x.

- PCIe Slots/Connectors:
  - PCIe x8 Connector (Slot #1) – CPU0
  - PCIe x8 Connector (Slot #2) – CPU0
  - PCIe x16 Riser Connector (Slot #3) – CPU0
  - PCIe x16 Riser Connector (Slot #4) – CPU1
  - PCIe x16 Riser Connector (Slot #5) – CPU1
  - PCIe x4 M.2 Connector (M.2 #1) – PCH
  - PCIe x4 M.2 Connector (M.2 #2) – PCH
  - PCIe x4 M.2 Connector (M.2 #3) – CPU1
  - PCIe x4 M.2 Connector (M.2 #4) – CPU1
  - PCIe x8 OCuLink Connector – CPU1
- SATA Connectors:
  - 4 x SATA 7-pin Connectors (SATA[3:0]) – PCH
  - 2 x SATA MiniSAS HD Connectors (SATA[7:4]/PCIe[15:12] & SATA[11:8]/PCIe[19:16]) – PCH
- BMC: ASPEED AST1250
  - All PCIe Slots are connected to BMC I2C Buses for PCIe Card telemetry
  - I2C MUXes are used to avoid I2C Address contention
- Security: SPI TPM2.0 Module
- Front IO Ports:
  - 1 x BMC Dedicated Management NIC Port
  - 2 x USB3.0 Ports
  - Power Button (Pre-Production Only)
  - Reset Button (Pre-Production Only)
  - 1 x Video Port (EMPTY)
  - 1 x 10GbE SFP+ Connector (EMPTY)

https://www.opencompute.org/documents/3u-server-intel-open-compute-specification-190718-pdf-1 at p. 11.

70. The Intel processors employed in the 3UN PCIe connect directly to a variety of LVDS channels that convey data bits in a serial stream using unidirectional pairs of lanes transmitting data in opposite direction, including Intel's DMI and PCIe channels, and the directly-connected PCIe channels connect the CPU to a graphics processor.

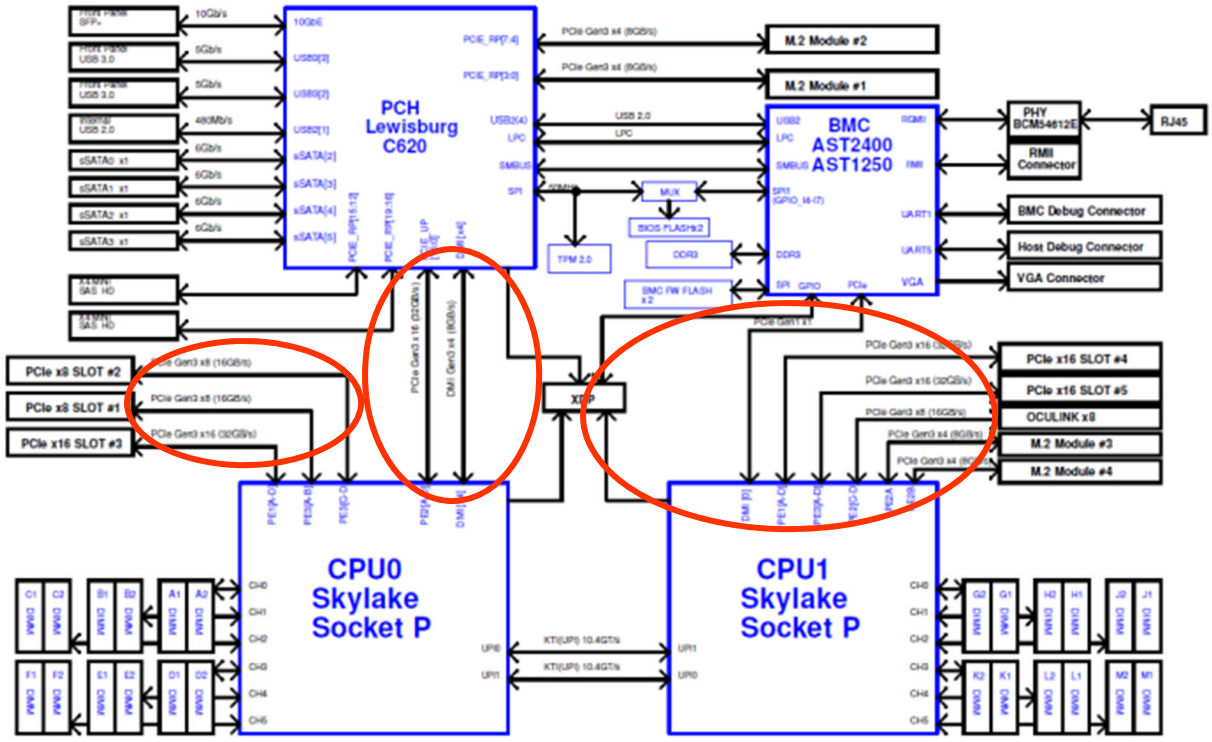


Figure 1: Motherboard Block Diagram

https://www.opencompute.org/documents/3u-server-intel-open-compute-specification-190718-pdf-1 at p. 12.

GPU Card	12	Nvidia Tesla T4 GPU, LP, 75W PCIe x16 Card

Id. at p. 10.

71. The Intel processors employed in the 3UN PCIe also connect to LVDS channels that convey USB data packets through pairs of unidirectional differential signal paths in opposite directions—USB 3.x ports.

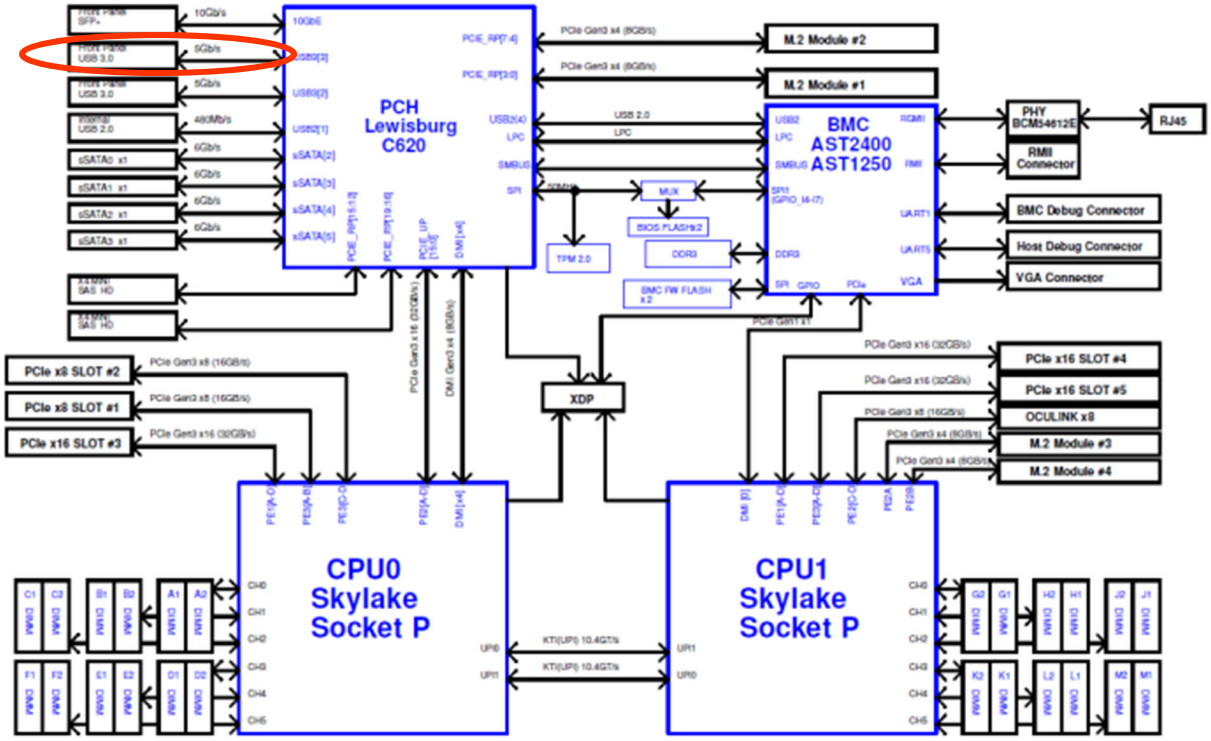


Figure 1: Motherboard Block Diagram

https://www.opencompute.org/documents/3u-server-intel-open-compute-specification-190718-pdf-1 at p. 12.

72. The 3UN PCIe has DDR4 system memory connected directly to the CPU.

- Processor:
  - 2 Socket Spread Core Design using Xeon (Skylake-SP/Cascade Lake-SP) Processors
  - Supports up to 205W TDP
  - Includes 1U Remote Heatsink
- Memory: 24 DDR4 DIMMs, 2 DIMMs per Channel

https://www.opencompute.org/documents/3u-server-intel-open-compute-specification-190718-pdf-1 at p. 11.

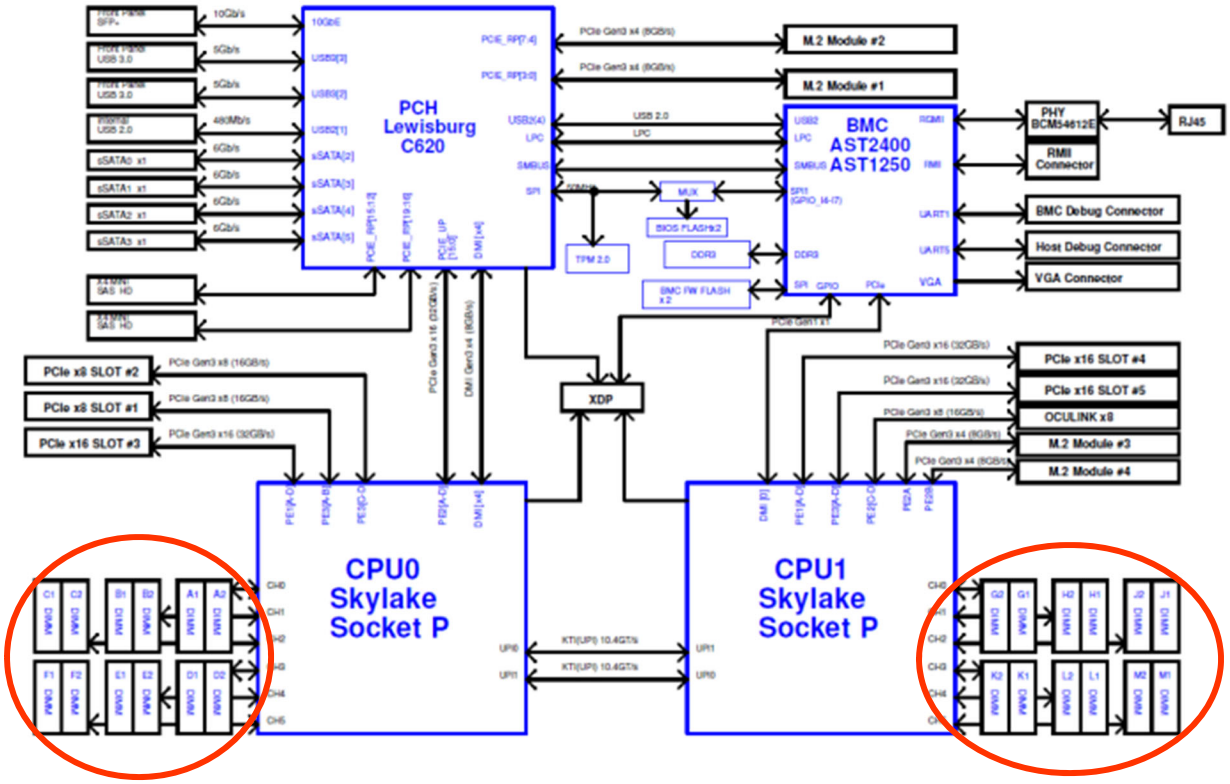


Figure 1: Motherboard Block Diagram

Id. at p. 12.

73. The 3UN PCIe has a mass storage SSD coupled to the CPU through the onboard NVMe PCIe interface that is directly connected to the CPU through PCIe channels or a mass storage card connected to the CPU through SAS.

Table 2: Supported System Configuration Options

Feature	Qty	Description
Chassis	1	3U, 19" EIA310-D Compliant supporting Project Olympus PMDU connections
Motherboard	1	Mount Olympus 2-Socket Intel Xeon Scalable Motherboard (Purley)
Processor	2	Intel® Xeon® Platinum 8168 processor (24 core, 2.7 Ghz, 205W)
Memory	12	32GB DDR4, DR, 2667 R-DIMMs; Total System Memory: 384GB
PCIe Riser 3 & 5	2	4-Slot Active PCIe x16 Riser Card with 96-lane PCIe Switch
PCIe Riser 4	1	5-Slot Active PCIe x16 Riser Card with 96-lane PCIe Switch
GPU Card	12	Nvidia Tesla T4 GPU, LP, 75W PCIe x16 Card
Ethernet	1	10G Single port SFP+ PCIe 2.0 x8 5GT/s
HDD/SSD	1	M.2 960GB NVMe SSD, PCIe x4 110mm (sourced from CPU)
Security	1	TPM2.0 SPI Module
System Fans	6	60mmx56mm Dual Rotor Fans
Power Supply	3	Project Olympus 1020W 3-Phase, non-LES PSU
Power Distribution	1	PDB and Cable Harnesses to support 12V Power to MB, Risers, PCIe Cards, and System Fans

Id. at 10.

74. The Intel processors used in the 3UN PCIe have a peripheral bridge called the C620 ("Lewisberg") series chipset PCH connected to the CPU via the DMI, which has an integrated controller.

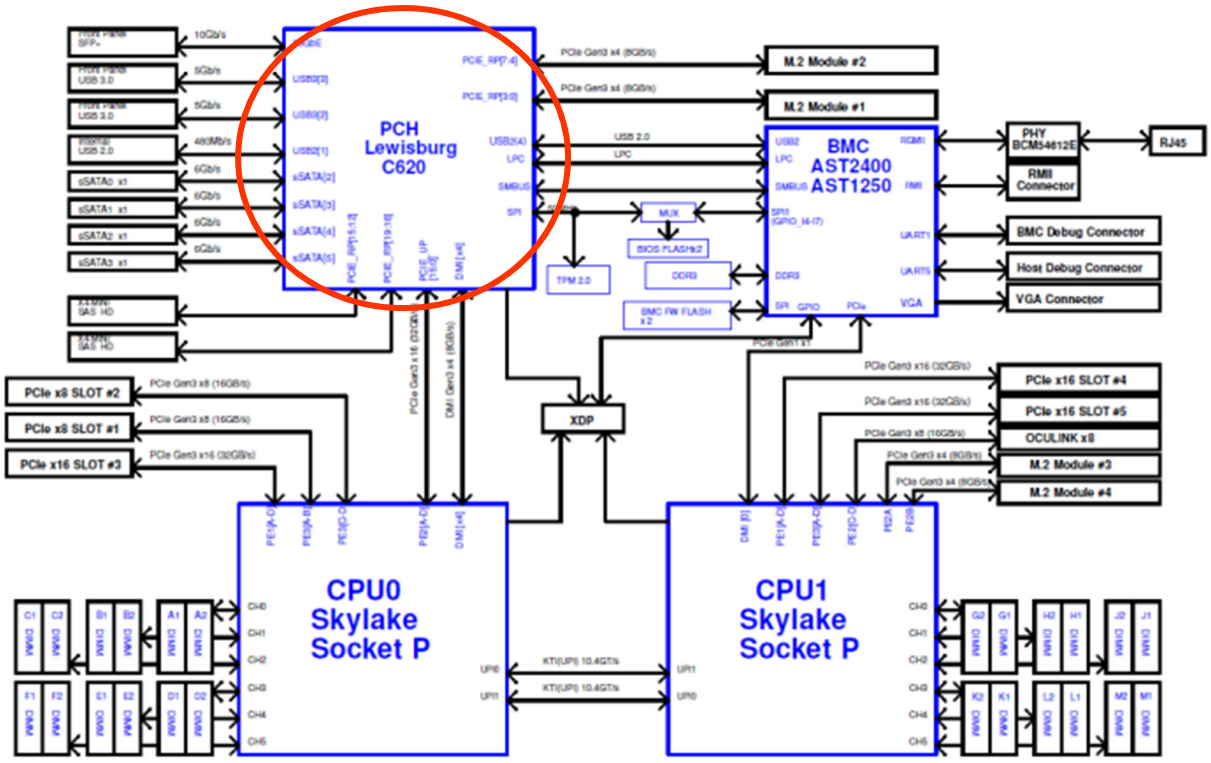


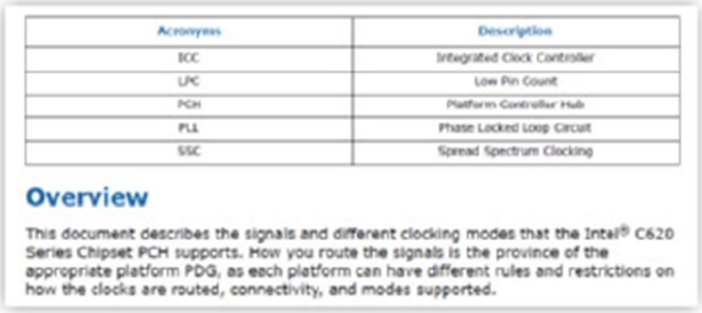
Figure 1: Motherboard Block Diagram

Id. at p. 12.

- Processor:
  - 2 Socket Spread Core Design using Xeon (Skylake-SP/Cascade Lake-SP) Processors
  - Supports up to 205W TDP
  - Includes 1U Remote Heatsink
- Memory: 24 DDR4 DIMMs, 2 DIMMs per Channel
- PCH: Lewisburg

Id. at p. 11.

75. The Intel C620 series PCH used in the 3UN PCIe has an Integrated Clock Controller (ICC) that includes PLL circuitry, which generates different clock frequencies to convey the PCI bus transactions and USB transactions through the PCIe and USB channels based on the different clock frequencies.



Acronyms	Description
ICC	Integrated Clock Controller
LPC	Low Pin Count
PCH	Platform Controller Hub
PLL	Phase Locked Loop Circuit
SSC	Spread Spectrum Clocking

Overview

This document describes the signals and different clocking modes that the Intel® C620 Series Chipset PCH supports. How you route the signals is the province of the appropriate platform PDG, as each platform can have different rules and restrictions on how the clocks are routed, connectivity, and modes supported.

Controls USB3Gen2PCIe PLL and its output clocks behavior. This offset is lockable by setting LOCK_G2PLLC bit (ICCSEC offset 1020h bit 10).

Intel® C620 Series Chipset Platform Controller Hub Datasheet, p. 98-116 (May 2019 Doc. No. 336067-007US).

A Differential Clock Buffer (DB600Z) is used to fanout additional PCIe Clocks. The Clock Buffer is set to PLL Bypass Mode by default. Recommend including resistor stuffing Options to change the PLL Bandwidth Mode if needed to improve Clock Jitter performance:

- PLL High BW Mode
- PLL Low BW Mode
- PLL Bypass Mode (default)

https://www.opencompute.org/documents/3u-server-intel-open-compute-specification-190718-pdf-1 at pp. 24, 32.

76. The Intel® Xeon® processor used in the 3UN PCIe also has integrated clock circuitry that includes PLL circuitry, which generates different clock frequencies to convey the PCI bus transactions through the PCIe channels based on the different clock frequencies.

2.2.6 System Reference Clocks (BCLK{0/1/2}_DP, BCLK{0/1/2}_DN)

The processor Core, processor Uncore, Intel® UPI, PCI Express* and DDR4 memory interface frequencies are generated from BCLK{0/1/2}_DP and BCLK{0/1/2}_DN signals. There is no direct link between core frequency and Intel UPI link frequency (e.g., no core frequency to Intel® UPI multiplier). The processor maximum core frequency, Intel® UPI link frequency and DDR memory frequency are set during manufacturing. It is possible to override the processor core frequency setting using software. This permits operation at lower core frequencies than the factory set maximum core frequency.

The processor core frequency is configured during reset by using values stored within the device during manufacturing. The stored value sets the lowest core multiplier at which the particular processor can operate. If higher speeds are desired, the appropriate ratio can be configured via the IA32_PERF_CTL MSR (MSR 199h); Bits [14:0]. For details of operation at core frequencies lower than the maximum rated processor speed.

Clock multiplying within the processor is provided by the internal phase locked loop (PLL), which requires a constant frequency BCLK{0/1/2}_DP, BCLK{0/1/2}_DN input, with exceptions for spread spectrum clocking. DC specifications for the BCLK{0/1/2}_DP, BCLK{0/1/2}_DN inputs are provided in Section 2.8.3.7, "Processor Asynchronous Sideband DC Specifications."

These specifications must be met while also meeting the associated signal quality specifications outlined in Section 2.10, "Signal Quality."

Details regarding BCLK{0/1/2}_DP, BCLK{0/1/2}_DN driver specifications are provided in the CK420BQ Clock Synthesizer/Driver Specification.

https://www.intel.com/content/www/us/en/products/docs/processors/xeon/2nd-gen-xeon-scalable-datasheet-vol-1.html at p. 15.

4.6 System Reference Clock Signals

Table 4-8. System Reference Clock (BCLK{0/1/2}) Signals

Signal Name	Description
BCLK{0,1,2}_DN/DP	Reference Clock Differential input. These pins provide the required reference inputs to various PLLs inside the processor, such as Intel® UPI and PCIe. BCLK0, BCLK1 and BCLK2 run at 100 MHz from the same clock source.

Id. at p. 57.

77. In view of the foregoing facts concerning the technical features and functionalities of the Accused ZT Products (*see* paragraphs 66-80), when ZT Systems or another party manufactures the Accused ZT Products, it improves the speed and performance of the peripheral data communication in its computer products by using a method of manufacturing that includes the

following steps: (a) connecting a CPU directly to a peripheral bridge on a printed circuit board; (b) directly connecting to the peripheral bridge one or more LVDS channels with pairs of unidirectional lanes that convey data in serial bit streams in opposite directions; and (c) providing a connector with an LVDS channel to facilitate data communication with external peripherals using two unidirectional serial lanes to transmit data in opposite directions, including USB protocol data.

78. On information and belief, ZT Systems or another party performs the foregoing manufacturing steps in the United States and/or outside the United States to make at least certain of the Accused ZT Products, and ZT Systems then imports those Accused ZT Products into the United States to be marketed and sold.

79. Through making, using, selling, and/or offering for sale in the United States, and/or importing into the United States, the Accused ZT Products with the features and functionalities alleged above, ZT Systems has infringed one or more of the claims in each of the ACQIS Patents.

80. ZT Systems' infringing conduct has caused injury and damage to ACQIS and ACQIS's licensees.

ACQIS Provided ZT Systems Actual Notice of its Infringement

81. On or around July 17, 2018, ACQIS notified ZT Systems, pursuant to 35 U.S.C. § 287(a), of all of the ACQIS Patents and ZT Systems' infringement thereof based on the Accused ZT Products. Specifically, ACQIS's letter identified all of the ACQIS Patents asserted herein and described the applicability of the ACQIS Patents to ZT Systems' "X86 and Intel® Xeon® server products." ACQIS provided examples of relevant server products: "XPO200 server products, OCS server products, Olympus platform server products, and OCP server products." ACQIS also described the enforcement history of ACQIS's patent portfolio, and specifically noted a prior

lawsuit enforcing ACQIS Patents related to the presently-asserted ACQIS Patents, which resulted in a significant jury verdict against IBM.

82. ACQIS invited ZT Systems to discuss potential licensing arrangements to allow ZT Systems to continue to utilize the patented technologies in the ACQIS patent portfolio, including the ACQIS Patents.

83. ZT Systems did not respond to ACQIS's July 17, 2018 letter and continued to make, import, and sell the Accused ZT Products identified in ACQIS's letter in willful violation of ACQIS' patent rights, or at the very least in reckless disregard of ACQIS' patent rights.

84. On or around September 10, 2020, ACQIS sent another letter to ZT Systems which included the July 17, 2018 letter as an attachment.

85. The September 10, 2020 letter noted that ZT Systems had spurned ACQIS's earlier invitation to take a license to the patents and instead had introduced new models of the products referenced in the earlier letter that also infringe the ACQIS Patents, including at least the OCP Project Olympus server solutions – XPO200 and the 3U PCIe Expansion Server.

86. Upon receiving actual notice of the ACQIS Patents and how they apply to ZT Systems' server products, ZT Systems at the very least ignored the notice and chose to remain willfully blind to its own infringement.

87. ZT Systems' choice to ignore ACQIS, the ACQIS Patents, and ACQIS' offer to engage in a licensing arrangement, and instead to continue making and selling the infringing Accused ZT Products, is egregious and exceptional.

88. ZT Systems' conduct constitutes willful infringement of the ACQIS Patents, beginning at least as early as July 17, 2018.

COUNT I
INFRINGEMENT OF U.S. PATENT NO. 9,529,768

89. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-88 of this Complaint in support of its first cause of action as though fully set forth herein.

90. Pursuant to 35 U.S.C. § 282, the claims of the ’768 patent are presumed valid.

91. In view of the foregoing facts and allegations, including paragraphs 56-88 above, ZT Systems has directly infringed one or more claims of the ’768 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, offering to sell, and/or importing the Accused ZT Products.

92. ZT Systems’ infringement of the ’768 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of the Accused ZT Products is shown by way of the exemplary 3UN PCIe server as set forth in paragraphs 66-80 above, which demonstrates infringement of at least claim 13 of the ’768 patent by showing:

(a) the 3UN PCIe is a computer;

(b) the 3UN PCIe has an integrated central processing unit (CPU) and interface controller in a single chip, because the 3UN PCIe uses an Intel® Xeon® (“Skylake”) Processor, which includes interface controllers (*e.g.*, to drive PCIe channels) and the CPU integrated as a single chip;

(c) the 3UN PCIe has a first LVDS channel directly extending from the interface controller to convey address and data bits of a PCI bus transaction in a serial bit stream, wherein the first LVDS channel comprises first unidirectional, multiple, differential signal pairs to convey data in a first direction and second unidirectional, multiple, differential signal pairs to convey data in a second, opposite direction opposite directions through different numbers of differential signal pairs, because the Intel® Xeon® (“Skylake”) Processors employed in the 3UN PCIe include PCIe channels

directly extending from the interface controller;

(d) the 3UN PCI has system memory directly coupled to the integrated CPU and interface controller, because the Intel® Xeon® ("Skylake") Processors employed in the 3UN PCIe are directly coupled to DDR3 system memory.

93. On information and belief, the Accused ZT Products are in relevant part substantially similar to the exemplary 3UN PCIe, in particular with regard to the manner in which the Accused ZT Products include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which ZT Systems infringes the claims of the '768 patent as to each of the Accused ZT Products.

94. ACQIS' infringement allegations against the Accused ZT Products are not limited to claim 13 of the '768 patent, and additional infringed claims will be identified through infringement contentions and discovery.

95. As early as around July 17, 2018, ZT Systems had actual notice of the '768 patent and the infringement alleged herein.

96. The above-described acts of infringement committed by ZT Systems have caused injury and damage to ACQIS and ACQIS's licensees.

97. ACQIS is entitled to recover all damages sustained as a result of ZT Systems' wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

98. ZT Systems' infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT II
INFRINGEMENT OF U.S. PATENT NO. 9,703,750

99. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-88 of this Complaint in support of its second cause of action as though fully set forth herein.

100. Pursuant to 35 U.S.C. § 282, the claims of the ’750 patent are presumed valid.

101. In view of the foregoing facts and allegations, including paragraphs 56-88 above, ZT Systems has directly infringed one or more claims of the ’750 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, offering to sell, and/or importing the Accused ZT Products.

102. ZT Systems’ infringement of the ’750 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of the Accused ZT Products is shown by way of the exemplary 3UN PCIe server as set forth in paragraphs 66-80 above, which demonstrates infringement of at least claim 1 of the ’750 patent by showing:

(a) the 3UN PCIe is a computer;

(b) the 3UN PCIe has an integrated central processing unit (CPU) and interface controller in a single chip, because the 3UN PCIe uses an Intel® Xeon® (“Skylake”) Processor, which includes interface controllers (*e.g.*, to drive PCIe channels) and the CPU integrated as a single chip;

(c) the 3UN PCIe has a first LVDS channel directly extending from the interface controller to convey address bits, data bits, and byte enable information bits of a PCI bus transaction in a serial bit stream, wherein the first LVDS channel comprises a first unidirectional, differential signal pair to convey data in a first direction and a second unidirectional, differential signal pair to convey data in a second, opposite direction, because the Intel® Xeon® (“Skylake”) Processors employed in the 3UN PCIe include numerous PCIe channels directly extending from the interface

controller;

(d) the 3UN PCIe has system memory directly coupled to the integrated CPU and interface controller, because the Intel® Xeon® ("Skylake") Processors employed in the 3UN PCIe are directly coupled to DDR3 system memory.

103. On information and belief, the Accused ZT Products are in relevant part substantially similar to the exemplary 3UN PCIe, in particular with regard to the manner in which the Accused ZT Products include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which ZT Systems infringes the claims of the '750 patent as to each of the Accused ZT Products.

104. ACQIS' infringement allegations against the Accused ZT Products are not limited to claim 1 of the '750 patent, and additional infringed claims will be identified through infringement contentions and discovery.

105. As early as around July 17, 2018, ZT Systems had actual notice of the '750 patent and the infringement alleged herein.

106. The above-described acts of infringement committed by ZT Systems have caused injury and damage to ACQIS and ACQIS' licensees.

107. ACQIS is entitled to recover all damages sustained as a result of ZT Systems' wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

108. ZT Systems' infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT III
INFRINGEMENT OF U.S. PATENT NO. 8,977,797

109. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-88 of this Complaint in support of its third cause of action as though fully set forth herein.

110. Pursuant to 35 U.S.C. § 282, the claims of the '797 patent are presumed valid.

111. In view of the foregoing facts and allegations, including paragraphs 56-88 above, ZT Systems has directly infringed one or more claims of the '797 patent in violation of 35 U.S.C. § 271(a) and/or (g) by importing into, or selling, offering to sell, or using in, the United States the Accused ZT Products that were manufactured by one or more of the methods claimed in the '797 patent.

112. The Accused ZT Products are not trivial or nonessential components of other products and are not materially changed by subsequent processes.

113. ZT Systems' infringement of the '797 patent through its importation into, and/or use, offers to sell, or sales in, the United States of the Accused ZT Products is shown by way of the exemplary 3UN PCIe server as set forth in paragraphs 66-80 above. These paragraphs demonstrate that the 3UN PCIe server was necessarily manufactured according to at least claim 36 of the '797 patent:

(a) ZT Systems or another party performs a method of improving data throughput on a motherboard when manufacturing the 3UN PCIe, which contains a motherboard;

(b) when manufacturing the 3UN PCIe, ZT Systems or another party mounts an integrated CPU and interface controller as a single chip on the motherboard, because the Intel processor employed in the 3UN PCIe includes interface controllers (*e.g.*, to drive/control PCIe channels) and the CPU integrated as a single chip;

(c) when manufacturing the 3UN PCIe, ZT Systems or another party connects an LVDS

channel directly to an interface controller integrated with the CPU, which LVDS channel uses two unidirectional, serial channels to transmit data in opposite directions because the 3UN PCIe has PCIe channels and a DMI interface directly connected to the interface controller;

(d) when manufacturing the 3UN PCIe, ZT Systems or another party increases data throughput in the serial channels by providing each channel with multiple differential signal line pairs, because the PCIe and DMI channels have multiple pairs of differential signal lanes;

(e) when manufacturing the 3UN PCIe, ZT Systems or another party configures the interface controller to adapt to different numbers of differential signal line pairs to convey encoded address and data bits of a PCI bus transaction in serial form, because the interface controllers integrated with the CPU are configured to convey PCIe data signals through PCIe channels having differential signal line pairs; and

(f) when manufacturing the 3UN PCIe, ZT Systems or another party couples the integrated CPU and interface device to a peripheral device such as a storage interface controller or a graphics processor, which is attached to the motherboard through a PCIe channel.

114. On information and belief, the Accused ZT Products are in relevant part substantially similar to the exemplary 3UN PCIe, in particular with regard to the manner in which the Accused ZT Products are manufactured and include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which ZT Systems infringes the claims of the ’654 patent as to each of the Accused ZT Products.

115. ACQIS' infringement allegations against the Accused ZT Products are not limited to claim 36 of the '797 patent, and additional infringed claims will be identified through infringement contentions and discovery.

116. As early as around July 17, 2018, ZT Systems had actual notice of the '797 patent and the infringement alleged herein.

117. The above-described acts of infringement committed by ZT Systems have caused injury and damage to ACQIS and ACQIS' licensees.

118. ACQIS is entitled to recover all damages sustained as a result of ZT Systems' wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

119. ZT Systems' infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT IV
INFRINGEMENT OF U.S. PATENT NO. RE46,947

120. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-88 of this Complaint in support of its fourth cause of action as though fully set forth herein.

121. Pursuant to 35 U.S.C. § 282, the claims of the '947 patent are presumed valid.

122. In view of the foregoing facts and allegations, including paragraphs 56-88 above, ZT Systems has directly infringed one or more claims of the '947 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, offering to sell, and/or importing the Accused ZT Products.

123. ZT Systems' infringement of the '947 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of the Accused ZT Products is

shown by way of the exemplary 3UN PCIe server as set forth in paragraphs 66-80 above, which demonstrates infringement of at least claim 19 of the ’947 patent by showing:

(a) the 3UN PCIe is a computer;

(b) the 3UN PCIe has an integrated central processing unit (CPU) because the 3UN PCIe uses an Intel® Xeon® (“Skylake”) Processor;

(c) the 3UN PCIe has a mass storage device directly coupled to the CPU, because the Intel® Xeon® (“Skylake”) Processors employed in the 3UN PCIe are coupled to the SSD;

(d) the 3UN PCIe has a low voltage differential signal (LVDS) channel directly extending from the CPU, the LVDS channel comprising two unidirectional, serial bit channels to convey data in opposite directions, because the Intel® Xeon® (“Skylake”) Processors employed in the 3UN PCIe include numerous PCIe channels directly extending from the interface controller;

(e) the 3UN PCIe has a CPU configured to output a serial bit stream of address bits, data bits, and byte enable information bits of a Peripheral Component Interface (PCI) bus transaction, because the Intel® Xeon® (“Skylake”) Processors employed in the 3UN PCIe include PCIe channels directly extending from the interface controller.

124. On information and belief, the Accused ZT Products are in relevant part substantially similar to the exemplary 3UN PCIe, in particular with regard to the manner in which the Accused ZT Products include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which ZT Systems infringes the claims of the ’947 patent as to each of the Accused ZT Products.

125. ACQIS' infringement allegations against the Accused ZT Products are not limited to claim 19 of the '947 patent, and additional infringed claims will be identified through infringement contentions and discovery.

126. As early as around July 17, 2018, ZT Systems had actual notice of the '947 patent and the infringement alleged herein.

127. The above-described acts of infringement committed by ZT Systems have caused injury and damage to ACQIS and ACQIS' licensees.

128. ACQIS is entitled to recover all damages sustained as a result of ZT Systems' wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

129. ZT Systems' infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT V
INFRINGEMENT OF U.S. PATENT NO. RE44,654

130. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-88 of this Complaint in support of its fifth cause of action as though fully set forth herein.

131. Pursuant to 35 U.S.C. § 282, the claims of the '654 patent are presumed valid.

132. In view of the foregoing facts and allegations, including paragraphs 56-88 above, ZT Systems has directly infringed one or more claims of the '654 patent in violation of 35 U.S.C. § 271(a) and/or (g) by using one or more of the methods claimed in the '654 patent to manufacture the Accused ZT Products and then importing, selling, offering to sell and/or using the Accused ZT Products in the United States.

133. The Accused ZT Products made using the methods claimed in the ’654 patent are not trivial or nonessential components of other products and are not materially changed by subsequent processes.

134. ZT Systems’ infringement of the ’654 patent through its importation into, and/or use, offers to sell, or sales in, the United States of the Accused ZT Products is shown by way of the exemplary 3UN PCIe server as set forth in paragraphs 66-80 above. These paragraphs demonstrate that the 3UN PCIe server was necessarily manufactured according to at least claim 23 of the ’654 patent:

(a) ZT Systems or another party performs a method of increasing data communication speed of a computer when manufacturing the 3UN PCIe;

(b) when manufacturing the 3UN PCIe, ZT Systems or another party connects a CPU directly to a peripheral bridge on a printed circuit board, because the 3UN PCIe uses an Intel core CPU directly connected to the Intel PCH via a DMI connection;

(c) when manufacturing the 3UN PCIe, ZT Systems or another party connects an LVDS channel directly to the peripheral bridge (PCH), which uses two unidirectional, serial channels to transmit data in opposite directions, because the 3UN PCIe has PCIe channels and a DMI channel directly connected to the Intel PCH;

(d) when manufacturing the 3UN PCIe, ZT Systems or another party provides a connector to connect the computer to a console, because the 3UN PCIe has a variety of connector ports such as USB 3.x;

(e) when manufacturing the 3UN PCIe, ZT Systems or another party provides a second LVDS channel using two unidirectional, serial channels to transmit data in opposite directions through the connector to the console, because the 3UN PCIe has USB 3.x

ports; and

(f) when manufacturing the 3UN PCIE, ZT Systems or another party enables the transmission of USB protocol data through the second LVDS channel via a USB 3.x port and channel.

135. On information and belief, the Accused ZT Products are in relevant part substantially similar to the exemplary 3UN PCIe, in particular with regard to the manner in which the Accused ZT Products are manufactured and include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which ZT Systems infringes the claims of the '654 patent as to each of the Accused ZT Products.

136. ACQIS' infringement allegations against the Accused ZT Products are not limited to claim 23 of the '654 patent, and additional infringed claims will be identified through infringement contentions and discovery.

137. As early as around July 17, 2018, ZT Systems had actual notice of the '654 patent and the infringement alleged herein.

138. The above-described acts of infringement committed by ZT Systems have caused injury and damage to ACQIS and ACQIS' licensees.

139. ACQIS is entitled to recover all damages sustained as a result of ZT Systems' wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

140. ZT Systems' infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

COUNT VI
INFRINGEMENT OF U.S. PATENT NO. 8,234,436

141. ACQIS incorporates by this reference the allegations set forth in paragraphs 1-88 of this Complaint in support of its sixth cause of action as though fully set forth herein.

142. Pursuant to 35 U.S.C. § 282, the claims of the ’436 patent are presumed valid.

143. In view of the foregoing facts and allegations, including paragraphs 56-88 above, ZT Systems has directly infringed one or more claims of the ’436 patent in violation of 35 U.S.C. § 271(a) by making, using, selling, offering to sell, and/or importing the Accused ZT Products.

144. ZT Systems’ infringement of the ’436 patent through its manufacture, use, offers to sell, and/or sales in, and/or importation into, the United States of the Accused ZT Systems is shown by way of the exemplary 3UN PCIe server as set forth in paragraphs 66-80 above, which demonstrates infringement of at least claim 13 of the ’436 patent by showing:

(a) the 3UN PCIe is a computer;

(b) the 3UN PCIe has a first LVDS channel comprising at least two sets of unidirectional, multiple serial bit channels to convey data in opposite directions, including but not limited to its PCIe and OPI channels;

(c) the 3UN PCIe has an integrated central processing unit (CPU) with a peripheral controller in a single chip directly coupled to one or more LVDS channels which can communicate encoded address and data bits of Peripheral Component Interconnect (PCI) bus transaction in serial form, because the Intel® Xeon® (“Skylake”) Processors employed in the 3UN PCIe are directly coupled to at least PCIe and OPI channels;

(d) the 3UN PCIe has system memory directly coupled to the integrated CPU and interface controller, because the Intel® Xeon® (“Skylake”) Processors employed

in the 3UN PCIe are directly coupled to DDR3 memory;

(e) the 3UN PCIe has a mass storage device coupled to the CPU, because the Intel® Xeon® ("Skylake") Processors employed in the 3UN PCIe are coupled to the SSD; and

(f) the 3UN PCIe has a second LVDS channel which conveys digital video data that are directly coupled to the integrated CPU with graphics controller, because the Intel® Xeon® ("Skylake") Processors employed in the 3UN PCIe are directly coupled to GPU via PCIe channels.

145. On information and belief, the Accused ZT Products are in relevant part substantially similar to the exemplary 3UN PCIe, in particular with regard to the manner in which the Accused ZT Products include and utilize PCIe and/or USB 3.x functionality. This Section is thus illustrative of the manner in which ZT Systems infringes the claims of the '436 patent as to each of the Accused ZT Products.

146. ACQIS' infringement allegations against the Accused ZT Products are not limited to claim 13 of the '436 patent, and additional infringed claims will be identified through infringement contentions and discovery.

147. As early as around July 17, 2018, ZT Systems had actual notice of the '436 patent and the infringement alleged herein.

148. The above-described acts of infringement committed by ZT Systems have caused injury and damage to ACQIS and ACQIS' licensees.

149. ACQIS is entitled to recover all damages sustained as a result of ZT Systems' wrongful acts of infringement, but in no event less than a reasonable royalty pursuant to 35 U.S.C. § 284.

150. ZT Systems' infringement as described herein has been willful and exceptional. Accordingly, ACQIS is entitled to recover enhanced damages up to three times the amount found or assessed at trial pursuant to 35 U.S.C. § 284, as well as its attorneys' fees pursuant to 35 U.S.C. § 285.

JURY TRIAL DEMANDED

ACQIS LLC hereby demands a trial by jury on all claims and issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff ACQIS LLC respectfully requests that this Court grant the following relief to ACQIS LLC:

A. enter judgment that ZT Systems has infringed one or more claims of each of the ACQIS Patents through: (1) the manufacture, use, offering to sell, and/or sale in the United States, and/or the importation into the United States, of infringing ZT Systems server products; (2) the practice of claimed methods of the ACQIS Patents by manufacturing, using, and/or testing ZT Systems server products in the United States; and (3) the importation into the United States of ZT Systems server products made abroad using patented processes claimed in the ACQIS Patents;

B. enter judgement that such infringement is willful;

C. enter judgment awarding ACQIS monetary relief pursuant to 35 U.S.C. § 284 in an amount adequate to compensate for ZT Systems' infringement of the ACQIS Patents to be determined at trial, but not less than a reasonable royalty, awarding ACQIS all pre- and post-judgment interest and costs, and awarding ACQIS enhanced damages for ZT Systems' willful infringement of the ACQIS Patents;

D. enter an order, pursuant to 35 U.S.C. § 285, declaring this an exceptional case and awarding to ACQIS its reasonable attorneys' fees; and

E. enter an order awarding to ACQIS such other and further relief, whether at law or in equity, that this Court seems just, equitable, and proper.

Dated: December 22, 2023. Respectfully submitted,

By: */s/ Paige Arnette Amstutz*

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