

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RED HAT, INC.
Petitioner,

v.

COMPETITIVE ACCESS SYSTEMS INC.
Patent Owner

U.S. Patent No. 11,418,641
Issued: August 16, 2022
Filed: December 14, 2020
Inventor: Eric M DeLangis
Title: Devices and Methods for Multipath Communications

**DECLARATION OF BILL LIN IN SUPPORT OF PETITION FOR *INTER*
PARTES REVIEW OF U.S. PATENT NO. 11,418,641 UNDER 35 U.S.C.
§ 312 AND 37 C.F.R. § 42.104**

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LIST OF EXHIBITS¹

Exhibit No.	Description
1001	Declaration of Bill Lin, Ph.D. in support of <i>Inter Partes</i> Review
1002	<i>Curriculum Vitae</i> of Bill Lin
1003	Certified Copy of U.S. Patent No. 11,582,343
1004	Certified File History of U.S. Patent No. 11,582,343
1005	Certified Copy of U.S. Patent No. 11,418,641
1006	Certified File History of U.S. Patent No. 11,418,641
1007	Certified Copy of U.S. Patent No. 10,868,908
1008	Certified File History of U.S. Patent No. 10,868,908
1009	Certified Copy of U.S. Patent No. 9,350,649
1010	Certified File History of U.S. Patent No. 9,350,649
1011	Certified Copy of U.S. Patent No. 8,861,349
1012	Certified File History of U.S. Patent No. 8,861,349
1013	Certified Copy of U.S. Patent No. 8,228,801
1014	Certified File History of U.S. Patent No. 8,228,801
1015	Certified Copy of U.S. Patent No. 7,606,156
1016	Certified File History of U.S. Patent No. 7,606,156
1017	U.S. Patent Application Publication No. 2004/0001512 A1 (“Challener”)
1018	U.S. Patent Application Publication No. 2003/0026221 A1 (“Kotzin”)
1019	James Carlson, <i>PPP Design, Implementation, and Debugging</i> (2d ed. 2000) (“Carlson”)
1020	Gilbert Held, <i>Network Design Principles and Applications</i> , 2000 (“Held”)
1021	U.S. Patent No. 6,917,960 (“Decasper”)

¹ Unless otherwise specified, citations are to the original page, column, and line numbers in exhibits rather than the PDF page. Citations corresponding to the PDF pagination are indicated in [[brackets]]. Unless otherwise noted, all emphases and annotations are added.

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Exhibit No.	Description
1022	Johnny Chen, <i>New Approaches to Routing for Large-Scale Data Networks</i> (Rice University, 1999) (“Chen”)
1023	Declaration of Sylvia Hall-Ellis
1024	Webster's Ninth New Collegiate Dictionary, 1990
1025	Xin, W., Ishihara, S., and Mizuno, T., <i>A QoS-ensured Transmission Scheme with Content-based Priority for Mobile Cluster Users</i> , 2000 (“Xin”)
1026	U.S. Patent Application Publication No. 2002/0042274 A1 (“Ades”)
1027	U.S. Patent No. 7,003,580 (“Cook”)
1028	U.S. Patent No. 5,625,877 (“Dunn”)
1029	U.S. Patent Application Publication No. 2002/010866 A1 (“McCullough”)
1030	Candace Leiden & Marshall Wilensky, <i>TCP-IP for Dummies</i> (3d ed. 1999) (“Dummies”)
1031	U.S. Patent Application Publication No. 2003/0223450 A1 (“Bender”)
1032	U.S. Patent Application Publication No. 2004/0022224 A1 (“Billhartz”)
1033	Hung-Yun Hsieh & Raghupathy Sivakumar, <i>A Transport Layer Approach for Achieving Aggregate Bandwidths on Multi-homed Mobile Hosts</i> (2002) (“Hsieh”)
1034	U.S. Patent No. 6,778,495 (“Blair”)
1035	Cisco Systems, Inc., <i>Troubleshooting Async Multilink PPP Operations</i> (2001) (“Cisco”)
1036	U.S. Patent Application Publication No. 60/377,631 (“Tucker”)
1037	Konishi et al., <i>Web SHAKE: A fast WWW access method for mobile terminals on temporary cluster networks</i> , IEEE Proceedings April 28-May 2, 2002 (“Konishi”)
1038	RFC 1990: The PPP Multilink Protocol (MP), August 1996
1039	<i>Competitive Access Systems, Inc. v. Oracle Corporation, and Oracle America, Inc.</i> , 1:23-ca-00286-ADA, Dkt. 82 (W.D.TX. Aug. 10, 2023)
1040	<i>Red Hat, Inc. v. Competitive Access Systems, Inc.</i> , 4:24-cv-00130-D, Dkt. 1 (E.D.N.C. Sep. 3, 2024)

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Exhibit No.	Description
1041	<i>Red Hat, Inc. v. Competitive Access Systems, Inc.</i> , 4:24-cv-00130-D, Dkt. 1-10 (E.D.N.C. Sep. 3, 2024)
1042	Lai et al., <i>Measuring Bandwidth</i> , IEEE (1999)
1043	RFC 2663: IP Network Address Translator (NAT) Terminology and Considerations, August 1999
1044	U.S. Patent No. 5,878,040 (“Peirce”)
1045	“A Novel Mechanism for Data Streaming Across Multiple IP Links for Improving Throughput and Reliability in Mobile Environments,” IEEE INFOCOM 2002 (“Phatak”)
1046	RFC 2543: SIP: Session Initiation Protocol, March 1999
1047	RFC 2131: Dynamic Host Configuration Protocol, March 1997
1048	RFC 1945: Hypertext Transfer Protocol – HTTP/1.0, May 1996
1049	Endler, David, <i>Brute-Force Exploitation of Web Application Session IDs</i> , iALERT White Paper, Nov. 1, 2001 (“Endler”)
1050	Rappaport, Theodore S., et al., <i>Wireless Communications and Application Above 100 GHz: Opportunities and Challenges for 6G and Beyond</i> , IEEE Access, Vol. 7, 2019 (“Rappaport”)
1051	Reex. Control No. 90/019,265
1052	Gast, Matthew S., <i>802.11 Wireless Networks – The Definitive Guide</i> , 2002
1053	Shoemake, Matthew B., <i>Wi-Fi (IEEE 802.11b) and Bluetooth CoExistence Issues and Solutions for the 2.4 GHz ISM Band</i> , Texas Instruments, Feb. 2001, Ver. 1.1
1054	Furuskär, Anders, et al., <i>EDGE: Enhanced Data Rates for GSM and TDMA/136 Evolution</i> , IEEE Personal Communications, June 1990
1055	RFC 2326: Real Time Streaming Protocol (RTSP), April 1998
1056	Random House Webster’s Computer & Internet Dictionary, 3 rd ed., December 1998
1057	Andrew S. Tanenbaum, <i>Computer Networks</i> , Chps. 1 & 5 (3d ed. 1996)
1058	Adolfo Rodriguez <i>et al.</i> , <i>TCP/IP Tutorial and Technical Overview</i> , Chps. 1 & 14 (Prentice Hall PTR 2002)

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Exhibit No.	Description
1059	Richard O. LaMaire, et al., <i>Wireless LANs and Mobile Networking: Standards and Future Directions</i> , IBM, May 31, 1996

I, Bill Lin, hereby declare as follows:

I. ASSIGNMENT

1. I have been retained as an expert witness on behalf of Red Hat, Inc. (“Red Hat”) to offer technical opinions regarding whether the claims of U.S. Patent No. 11,418,641 (“the ’641 Patent”) (Ex. 1005), would have been invalid to one of ordinary skill in the art as of October 15, 2002 in connection with the above-captioned Petition for *Inter Partes* Review (“IPR”).

2. For the purposes of my Declaration, I have been asked to assume that the priority date of the alleged invention recited in the ’641 Patent is October 15, 2002 (hereinafter the “Priority Date”).

3. I am not currently, and never have been, an employee of Red Hat. I received no compensation for this Declaration beyond my normal hourly compensation based on my time actually spent analyzing the ’641 Patent, the prior art cited below, and issues related thereto. I will not receive any added compensation based on the outcome of any IPR or other proceeding involving the ’641 Patent. I have no financial interest in Red Hat.

4. In forming the opinions expressed in this Declaration, I have also relied on my academic and professional experience. I also considered the viewpoint of a person having ordinary skill in the art as of the time of the alleged invention of the Challenged Patents. I also relied on the ’641 Patent and its file history, the reference

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and other documents cited in the petition and in the declaration, as well as on the exhibits in the exhibit list.

II. BACKGROUND AND QUALIFICATIONS

5. I am an expert in the field of computer engineering and have been an expert in that field since before the Asserted Patents were filed. A copy of my curriculum vitae and prior testimony is attached to this report (Ex. 1002) and provides a comprehensive description of my relevant experience, including my academic and employment history, publications, professional activities, and speaking engagements.

6. I received a B.S. in Electrical Engineering and Computer Sciences from the University of California, Berkeley, in 1985. I received an M.S. in Electrical Engineering and Computer Sciences in 1988 and a Ph.D. in Electrical Engineering and Computer Sciences in 1991, both from the University of California, Berkeley.

7. I am currently a Full Professor and the Department Chair of Electrical and Computer Engineering at the University of California, San Diego (“UCSD”), where I have been a professor since 1997.

8. At UCSD, my teaching and research has focused on computer architecture and computer networking problems, including the design of multiprocessor and multi-core processor architectures, multiprocessor and multi-core processor interconnection buses and networks, network processors, system-on-

chips, and data networks. I regularly teach senior-level design courses on advanced FPGA designs and the design of advanced processors, and I have taught graduate courses in hardware/software co-design and advanced special topics in computer architecture.

9. At UCSD, I am a Principal Investigator in the UCSD Center for Wireless Communications (CWC). CWC brings together researchers to work on a range of challenges in the design of future wireless communications systems. My contribution to CWC has been expertise in the design of multi-core processor architectures for wireless communications and mobile computing. I am also a Principal Investigator in the UCSD Center for Networked Systems (CNS). CNS brings together researchers to work on a range of challenges in the design of computer architecture solutions for packet processing and computer networking.

10. Before joining UCSD, I led the System Control and Communications Group at IMEC, Europe's largest independent microelectronics and information technology research center. At IMEC, I led a research team working on VLSI architecture, system design, and circuit techniques for system-on-chip applications. I also previously held positions at Hewlett Packard, Hughes Electronics, and Western Digital.

11. During my career, I have received or worked on research efforts that received millions of dollars in research funding from both government agencies and

industry, including funding for research in multi-core processor design, hardware/software co-design, packet processing, and computer networks.

12. I have authored numerous publications, including books, chapters in books, and journal papers, and I have presented numerous invited lectures and keynote presentation around the world. A number of my publications have received best paper awards or distinguished paper citations, including best paper awards in the IEEE Transactions on VLSI Systems and the ACM/IEEE Design Automation Conference, and I have also been awarded five patents.

13. I have served as an Associate or Guest Editor for several prestigious journals published by the Association for Computer Machinery (“ACM”) and the Institute of Electrical and Electronics Engineers (“IEEE”). I have also served on the Editorial Board of the International Journal of Embedded Systems. Further, I have served as General Chair of several ACM/IEEE conferences, and on the Organizing or Steering Committees of many ACM/IEEE conferences, including the ACM/IEEE Symposium on Networks-on-Chips (NOCS) and the ACM/IEEE Symposium on Architectures for Networking and Communication Systems (ANCS). I have served on the Technical Program Committees of over 45 ACM/IEEE conferences.

III. UNDERSTANDING OF PATENT LAW

14. I am not an attorney, but I have been provided with an understanding of the patent law relevant to conducting the analysis given in this report. The following represents a summary of my understanding of these issues.

15. I have been informed and understand that patent claims are construed from the perspective of a person of ordinary skill in the art (“POSITA”) at the time the claimed invention was made and that, during this proceeding, terms are ordinarily to be given their plain and ordinary meaning as would be understood by a POSITA. I understand that this is the same standard as would be applied in District Court litigation.

16. I understand that claims in an IPR are construed under the case *Phillips v. AWH Corp.*, 415 F.3d 1303, decided by the Federal Circuit in 2005. I understand that under the rule in *Phillips*, words of claims are given their plain and ordinary meaning as understood by a person of ordinary skill in the art in view of the specification and prosecution history, unless those sources show an intent to depart from such meaning. No terms need to be construed for the purposes of this declaration. I reserve the right to respond to any constructions offered by the Patent Owner or adopted by the Board.

17. I understand that in IPR a claim is unpatentable if it is anticipated or obvious. Anticipation of a claim requires that every element of a claim be disclosed

expressly or inherently in a single prior art reference, arranged in the prior art reference as arranged in the claim. An element is inherent if it is necessarily present in the reference.

18. It is my understanding that a patent claim is unpatentable for obviousness if the claimed invention would have been obvious at the time the invention was made to a person having ordinary skill in the art.

19. I understand that, for the purpose of an IPR, the Board may only consider anticipation or obviousness based on prior printed publications or prior patents and patent applications. I understand that a publication is prior art under § 102(a) if that publication was known or used by others in the U.S., or was patented or published anywhere, prior to the date of invention of the '641 Patent. I understand that a publication is prior art under § 102(b) if that publication was patented or published anywhere, or was in public use, on sale, or offered for sale in this country, more than one year prior to the earliest U.S. filing date of the '641 Patent. I understand that a patent or patent application is prior art under § 102(e) if that patent or published patent application has an effective filing date that is prior to the date of invention of the '641 Patent.

20. I have been informed and understand that the subject matter of a patent claim is obvious if the differences between the subject matter of the claim and the prior art are such that the subject matter as a whole would have been obvious at the

time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. I have also been informed that the framework for determining obviousness involves considering the following factors: (i) the scope and content of the prior art; (ii) the differences between the prior art and the claimed subject matter; (iii) the level of ordinary skill in the art; and (iv) any objective evidence of non-obviousness.

21. I further understand that a claim can be found obvious if it unites old elements with no change to their respective functions or alters prior art by mere substitution of one element for another known in the field, with that combination yielding predictable results. While it may be helpful to identify a reason for this combination, common sense should guide, and there is no rigid requirement for a teaching, suggestion, or motivation to combine. When a product is available, design incentives and other market forces can prompt variations of it, either in the same field or different one. If a person having ordinary skill in the relevant art can implement a predictable variation, obviousness likely bars patentability. Similarly, if a technique has been used to improve one device, and a person having ordinary skill in the art would recognize that the technique would improve similar devices in the same way, use of the technique is obvious. I further understand that a claim may be obvious if common sense directs one to combine multiple prior art references or add missing features to reproduce the alleged invention recited in the claims.

22. I also understand the following rationale may support a finding of obviousness:

- a. Combining prior art elements according to known methods to yield predictable results;
- b. Simple substitution of one known element for another to obtain predictable results;
- c. User of known technique to improve similar devices (methods, or products) in the same way;
- d. Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- e. “Obvious to try” — choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- f. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- g. Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

23. I also understand that it is impermissible to use the claimed invention itself as a blueprint for piecing together elements in the art. In other words, it is impermissible to use hindsight reconstruction to pick and choose among disclosures in the prior art to reconstruct the claimed invention.

24. I understand that so-called “secondary considerations of nonobviousness,” must be considered in an obviousness analysis. I understand that an analysis including these secondary considerations helps to prevent the forbidden use of hindsight in determining whether a patent claim is obvious. I understand that secondary considerations of non-obviousness include, among others: (a) a long-felt but unresolved need for the invention; (b) commercial success of the invention; (c) copying of the invention; (d) praise and recognition of the invention by others; (e) licensing of the rights to the invention; and (f) unexpected results.

25. In rendering my opinions, I followed these guidelines.

IV. SUMMARY OF OPINIONS

26. I have reviewed and agree with the analysis in the Petition for IPR of the '641 Patent. It is my opinion that each and every Challenged Claim would have been obvious to a person of ordinary skill in the art (“POSITA”) at the time of the alleged invention in view of the knowledge of a POSITA and prior art cited in the Petition and as further explained in this declaration.

27. It is my opinion that claims 1–3 are obvious in view of Challenger (Ex. 1017) (Ground I).

28. It is my opinion that claims 1–3 are obvious in view of Kotzin (Ex. 1018) (Ground II).

V. OVERVIEW OF THE TECHNOLOGY

29. I have read and agree with the technology overview in the Petition.

VI. THE '641 PATENT

A. Claims

30. The '641 Patent titled “Devices and Methods for Multipath Communications” issued from U.S. Patent Application No. 17/120,549 (“’549 Application”) on August 16, 2022. The '641 Patent claims priority to Provisional Application No. 60/418,521 (“’521 Application”), filed on October 15, 2002. The '641 Patent discloses devices and methods for combining voice, data, and video communications and transmitting these communications over multiple paths, thereby increasing available bandwidth and data throughput.

31. The '641 Patent has 3 claims of which claim 1 is independent. The independent claim 1 is directed to a device capable of providing broadband communications services. Claim 1 is reproduced below:

1. A communications device that is capable of providing broadband communications services, comprising:

at least one connection for connecting to a communications network;

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at least one wireless interface for connecting wirelessly to
at least one remote communications device; and

a processor that

requests the at least one remote communications device to
assist in transferring data,

sends a request to the at least one remote communications
device for availability for participating in a multilink
communication,

if available, sends control information through the at least
one remote communications device for participating in a
multilink connection,

receives packets from the at least one remote
communications device, and

aggregates the data from the at least one remote
communications device with data transfers from the at
least one connection to increase data bandwidth for the
communications device.

Ex. 1005, claim 1.

B. Specification

32. According to the specification, Local Exchange Companies, (“LECs”) had a “strangle hold” over “the ‘last mile’ of copper over which almost all residential customers receive their communications services.” Ex. 1005, 1:28-32. Competitive Local Exchange Companies (“CLECs”) worked to resell existing services offered by LECs but were not able to truly compete in the market. *Id.* 1:44-61. To attract customers, companies were attempting to provide Voice Over IP services (VoIP) “over high-speed or broadband backbones just as DSL and cable modems, over

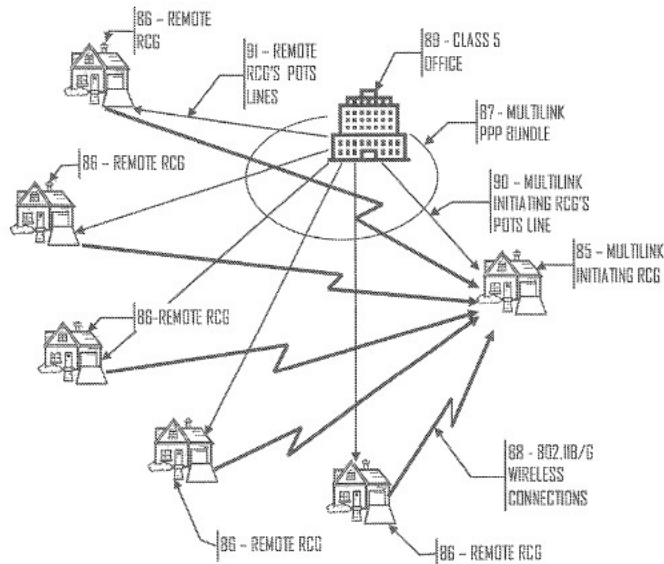
Internet connections via a computer.” *Id.* 2:12-15. However, as the specification explains, the high-speed services required enhancing infrastructure to the local telephone companies’ facilities and cable plants, which is very expensive. *Id.* 2:15-18. The high-speed services also required installing expensive modems at the customer’s end. *Id.* These services were also difficult to install and were hard to use for the average user so were primarily provided to corporate markets rather than residential users. *Id.* 2:18-28. While residential users could obtain high speed services through DSL and cable modems, the specification deems these solutions a failure because they “reach only a small segment of the population” and many DSL service providers failed during the collapse of the internet boom. *Id.* 2:29-36. Accordingly, the specification identifies a need for residential customer access to higher speed connections that do not require DSL, cable modems, or replacing last mile communication infrastructure.

33. To address this problem in the art, the ’156 Patent proposes using a specialized Residential Communications Gateway (“RCG”), which is a stand-alone external device that having the capabilities and features of “IP routers, Class 5 circuit switches and wireless LANs in a small stand-alone external modem like device.” *Id.* 2:40-42. The RCG has additional capabilities of a hands-free speakerphone device with a touch display, which can provide video telephone services. *Id.* 2:42-48.

34. The alleged benefit of the RCG is that a Competitive Local Exchange Company (CLEC) can offer a variety of services to customers using the existing POTS line, and it doesn't require the expensive enhancements of the network infrastructure like DSL and Cable services. The specification further explains that the RCG can be readily deployed to quickly expand CLEC customer bases because extra equipment is not needed. *Id.* 3:16-30. Indeed, the specification states that "[t]he RCG is designed to enhance, not replace, the existing phone line, enabling it to provide new combined packetized voice and data services" and will "continue to work seamlessly" with "all existing telecommunications infrastructure." *Id.*, 3:31-35.

35. The specification describes an RCG receiving data over at least two separate communication paths and combines the paths to increase bandwidth. *Id.*, Abstract. It further indicates that the RCG has "a main system processor that is responsible for all house keeping and traffic routing tasks." *Id.* 3:9-12. The specification further explains that the RCG can be placed in a residence and be connected to a POTS line (a telephone line) coming from the Local Exchange Carrier (LEC). *Id.*, 2:58-60. Devices like telephones, FAX machines, computers, or Local Area Network (LAN) can be connected to the RCG via the built in Universal Serial Bus (USB) or the Ethernet interface. *Id.*, 2:49-57.

36. The RCG also “implements broadband” over POTS by using an 802.11b/g wireless interface to configure a PPP multilink bundle. *Id.* 11:28-30. The specification, however, clarifies that “[a]ny wireless interface scheme can be used to implement this device” and “there is nothing special or specific to the 802.11 wireless interface that makes it particularly suited to this application.” *Id.* 11:41-44. The specification also explains that an individual RCG is also “used to provide a peer-to-peer wireless home networking environment to other 802.11 compatible wireless component within the residence” while also “acting as an always on dialup Internet gateway.” *Id.* 11:45-50. During data transmission, in order to gain greater bandwidth, an RCG can request that other RCGs assist in transferring data by using their respective POTS lines. *Id.* 11:50-59. For example, Figure 7 shows “an ad-hoc wireless LAN configuration with ppp multilink data distribution and wireless connectivity.”



Id., 4:25-26, Fig. 7.

37. Elements like wired and wireless networks, residential voice and data services, including IP routers, Class 5 circuit switches, and wireless LANs, sharing and dynamically routing and allocating bandwidth including through standardized methods like Multilink PPP, sending packets and allocating bandwidth through protocols like the Link Control Protocol for Multilink PPP, and routing tables such as those available in IP router devices were well known in the art at that time. Indeed, the specification itself confirms these elements were widely used in the communications field. *See id.*, 2:58-3:7 (describing wired and wireless networks and stating an RCG can be connected to a telephone line, LAN through a USB, firewire, or Ethernet ports and various devices through 802.11b/g interface for wireless communication), 1:25-27, 2:12-28, 2:40-42 (stating an RCG's primary function is

to compete with existing companies for residential voice and data services and explaining that an RCG combines capabilities of IP routers, Class 5 circuit switches and wireless LANs), 11:28-44 (describing a well-known 802/11 b/g interface used to configure multilink PPP bundle consistent with RFC 1990 protocol to share and dynamically route and allocate bandwidth), 12:5-14:12 (describing well-known Link Control and Multilink PPP protocols for sending packets and allocating bandwidth), 15:12-25 (describing routing tables used by IP router devices).

C. Prosecution History

38. I have reviewed the prosecution history of the '641 Patent. I understand that there was no substantive discussion of any prior art reference, that no claims were rejected over prior art, and that the applicant never submitted an information disclosure statement (IDS) to the USPTO.

D. Person of Ordinary Skill in the Art

39. I understand that there are multiple factors relevant to determining the level of ordinary skill in the pertinent art, including the educational level of active workers in the field at the time of the alleged invention, the sophistication of the technology, the type of problems encountered in the art, and the prior art solutions to those problems.

40. In determining the characteristics of a hypothetical person of ordinary skill in the art of the '641 Patent at the time of the alleged invention, I considered

several factors, including the type of problems encountered in this field, the swiftness with which innovations were made, the sophistication of the technology involved, and the educational background that would be necessary to understand the '641 Patent. Finally, I placed myself back in the relevant periods of time and considered the state of the art and the level of skill of those working in this field at those times.

41. In my opinion, taking all of the factors into account, a person of skill in the art for the '641 Patent would have had at least a bachelor's degree in electrical engineering, computer science, or a related field, and at least one year of experience with network design. Individuals with different education and additional experience could still be of ordinary skill in the art if that additional experience compensates for a deficit in their education and experience.

42. I also note that my opinions provided in this Declaration would not change in view of any minor modifications to this level of skill.

VII. CLAIM CONSTRUCTION

43. I understand that for the purposes of this inter partes review, the claims are to be construed under the so-called Phillips standard, under which claim terms are given their ordinary and customary meaning as would be understood by one of ordinary skill in the art in light of the specification and prosecution history, unless the inventor has set forth a special meaning for a term.

44. I further understand that pursuant to 37 C.F.R. § 1.906, in IPR proceedings, claims are evaluated based on the requirements of 35 U.S.C. § 112 only with respect to subject matter added or deleted in the reexamination proceedings themselves. For example, it is my understanding that indefiniteness of a claim term cannot be raised in an IPR. Accordingly, I have not considered §112 challenges for this declaration, but I reserve the right to do so in litigation or any other forum. The fact that I have sought to express a meaning for each claim, or not otherwise challenged the definiteness of any terms, is not a concession that the term is not indefinite, and I reserve the right to render my opinion in litigation that certain limitations are indefinite.

45. In my view, there is no need to construe any terms for the purpose of the Petition or my Declaration. If Patent Owner raises claim construction arguments, I reserve the right to respond. Additionally, I reserve the right to render my opinion on claim construction in litigation.

VIII. OVERVIEW OF THE PRIOR ART

46. I have read the and agree with the characterization of the prior art in the petition.

IX. SPECIFIC GROUNDS FOR PETITION UNDER 37 C.F.R. § 42.104(B)

A. Ground I: Claims 1-3 are Obvious in View of Challenger

1. Dependent Claim 2

a. “The communications device of claim 1, wherein the at

least one remote communications device is at least one of a residential communications gateway, a cable modem, a digital subscriber line, a wireless device, a neighborhood access point device, a Wi - Fi device and a cellular phone.”

47. In my opinion, Challenger discloses or at least renders obvious the additional limitation of claim 3. Specifically, Challenger discloses that its BSDs are *wireless devices*. EX1017, Abstract (“The master [BSD] **wirelessly** communicates with slave [BSDs]”), ¶ [0014] (explaining that Challenger’s improved BSD “**wirelessly** aggregate[s] and arbitrate[s] available bandwidth”) (emphasis added), ¶ [0020] (“Through **wireless** communications, the master [BSD] detects other [BSDs]”) (emphasis added), ¶ [0021] (“The bandwidth sharing performs all functions necessary . . . using **wireless** transmission techniques known in the art.”) (emphasis added). Moreover, Challenger discloses that its BSDs are capable of operating through “wireless communications over wireless networks as commonly known in the prior art,” including in accordance with the 802.11 WiFi standards, rendering Challenger’s BSDs also *WiFi devices*. *Id.* ¶ [0039]. Furthermore, in my opinion, a POSITA would have understood and found obvious that the additionally enumerated devices were well-known in the art and that any of the claimed devices would have been obvious to use as the *communications device* of claim 1. Thus, a POSITA would have found it obvious that Challenger discloses *the at least one*

remote communications device (slave BSD(s)) as satisfying the requirement that it
is at least one of a . . . wireless device . . . [or] a Wi-Fi device.

2. Dependent Claim 3

- a. “The communications device of claim 1, wherein the communications network is at least one of a public wired network, a private wired network, a public wireless network, and a private wireless network.*

48. It is helpful for me to discuss the terms public and private networks. Challenger discloses that its last mile telecommunications lines 110 establish connectivity to telecommunications providers 102, which in turn interface with the Internet 104 via broadband telecommunications lines 106. *Id.*, ¶ [0034]- [0035], Fig. 2. A POSITA would have recognized that the Internet is inherently composed of a combination of interconnected networks, encompassing public wired networks, private wired networks, public wireless networks, and private wireless networks. Ex. 1057 at 9-16, 52. Consequently, by virtue of connecting to the Internet, Challenger’s bandwidth sharing device (BSD) is capable of interfacing with each of these network types.

49. Additionally, Challenger discloses that its telecommunication provider networks are accessed by subscribers.” *Id.* ¶ [0009]. Because one needs to be a subscriber, the network is private. It was well understood that connections may be classified as either private or public, depending on factors such as whether a subscription is required for access, or firewall or gateway configurations, which

restrict or permit access to specific user groups. Ex. 1057 at 410-412. Further, Challenger's telecom networks are accessed through dedicated physical connections such as copper lines to individual residences, further confirming that they are private. EX1017, ¶¶ [0006], ¶ [0035]. Thus, Challenger's system renders it apparent to a POSITA that the first network may be a private or public, wired or wireless network, consistent with established networking practices.

50. Furthermore, Challenger discloses wireless or wired networks. Ex. 1017, ¶ [0039]. It states that “[i]n the preferred embodiment, the communications between the end user terminals 108 and the [BSDs] 202 can occur over land lines, as in the case of a hardwired local area network, as well as through *wireless communications over wireless networks* as commonly known in the prior art.” Thus, Challenger also renders obvious the *communications network* being a *private wireless network* or a *private wired network*.

B. Ground II: Claims 1-3 are Obvious in View of Kotzin

1. Independent Claim 1

- a. [1.3.i] a processor that requests the at least one remote communications device to assist in transferring data,*

51. It is helpful for me to provide additional context regarding requesting devices to assist in transferring data by the processor. Kotzin explains that its *processor* executes the bandwidth sharing functionality of its wireless units, including the task of requesting that wireless units 106B-N *assist in transferring*

data. Ex. 1018, ¶ [0023] (“For example, the processing apparatus 112 may . . . among other things, **determine** whether the wireless apparatus 106a will allow **shared use** of its wireless local area network **wireless resources** with proximal wireless units 106b-106n.”). These tasks include setting up bandwidth sharing by sending query messages to the other wireless units to determine if they can participate in the connection. Ex. 1018, ¶ [0037] (“[T]he wireless apparatus 106a sends **query messages** . . . to determine which proximal wireless units in the LAN can hear the query message[.]”), [0038] (“[P]articipation response messages 506a-506d indicate the **number of megabits per second** that each proximal wireless apparatus is **capable of providing** by sharing some of its wireless resources.”). A POSITA would have understood that these tasks are performed by a processor.

b. [1.3.iii] if available, sends control information through the at least one remote communications device for participating in a multilink connection,

52. It is helpful for me to discuss here the term “send[ing] control information.” Kotzin discloses that UNIT 1 sends partial bandwidth requests 510A-D to UNITS 2, 3, 4, N. Ex. 1018, Fig. 5, ¶ [0040]. Kotzin further explains that messages 510A, B, C, and D in Kotzin’s Figure 5 inform UNITS 2, 3, 4, and N of the amount of bandwidth they will share with UNIT 1, rendering these messages as *control information*. Ex. 1018, Fig. 5. In my opinion, a POSITA would have understood and found obvious that these messages 510A-D constitute *control*

information because rather than carrying data, these messages carry information that dictates how much bandwidth UNITS 2-N are to share with UNIT 1. A POSITA would have understood and found obvious that messages that carry directions for the execution of transferring data but that are incapable of transmitting data themselves constitute *control information*. Accordingly, in my opinion, a POSITA would have understood and found obvious that Kotzin's messages 510A-D are *control information*.

c. *receives packets from the at least one remote communications device, and*

53. I provide here additional explanation regarding term "receiv[ing] packets," which would be helpful to provide context for the analysis provided in the petition. Kotzin discloses *receiv[ing] packets*. Specifically, Kotzin explains that "[w]hen each of the participating proximal wireless units receives their respective subsets of the total information for the destination unit (*i.e.*, wireless apparatus 106a), **each of the units then retransmits the respective portions of the communication to the wireless apparatus 106a** as shown by messages 514A-514D." Ex. 1018, ¶ [0040]. A POSITA would have understood that the wireless units' retransmission of portions of data to the destination of wireless unit 106a results in the wireless unit 106a's (claimed *communications device* in preamble of claim 1) *recei[pt]* of *packets* of data.

54. A POSITA would have found obvious that data communications in Kotzin’s disclosure are packet-based. A POSITA would also find it obvious that the digital communications disclosed by Kotzin are packet-based. Specifically, Kotzin explains that its wireless units can communicate using the IEEE 802.11 and Bluetooth protocols, both of which use packet-based communications. Ex. 1018, ¶ [0022]. Furthermore, Kotzin discloses that its wireless units communicate with Internet Web servers. *Id.* ¶ [0035]. In my opinion, a POSITA would have known that these Internet Web servers use data packets based on the TCP/IP protocol. Finally, Kotzin additionally discloses that its wireless units can communicate with a GSM or CDMA network. *Id.* ¶ [0035]. In my opinion, a POSITA would have known that all these networks use packet-based communications. *Id.*, ¶ [0022]; *see* EX1052 (802.11 Wireless Networks – The Definitive Guide 2002) at 54 (“Figure 3-13 shows how 802.2 LLC encapsulation is used to carry an *IP packet*.”); EX1053 (Shoemake-Wi-Fi and Bluetooth) at 14 (“Since acknowledgements are embedded Bluetooth *packets*, throughput can be improved by hopping through a sequence of good hop frequencies and thereby not needlessly retransmitting any data due to lost acknowledgements.”); EX1054 (Furuskar – Edge Enhanced Data Rates for GSM) (“The current GSM standard provides data services with user bit rates up to 14.4 kbps for circuit switched data and up to 22.8 kbps for *packet data*.”); EX1055 (Rappaport et al-Wireless Communications) (“Tantivy Communications, of

Melbourne, FL, has developed an alternative approach to *packet-based CDMA* that also exploits the wireless channel using phased-array antennas.”); EX1058, 27 (“Protocols such as Bluetooth, IEEE 802.11, and Wireless Application Protocol (WAP) are paving the way towards a wireless Internet.”), 520 (listing GSM and CDMA as included in WAP).

2. Dependent Claim 3

- a. “*The communications device of claim 1, wherein the communications network is at least one of a public wired network, a private wired network, a public wireless network, and a private wireless network.*”

55. It is helpful for me to discuss the terms public and private networks. In my opinion, Kotzin discloses the additional limitation of claim 8. Kotzin discloses that each UNIT may communicate over “a digital cellular communication system, *the Internet*, or any other suitable communication system.” Ex. 1018, ¶ [0022]. A POSITA would have understood that the Internet comprises each of the claimed network types. See Section IX.A.2.a. Kotzin additionally discloses that its external network 104 might take the form of a GSM network, which a POSITA would have understood is typically a *private wireless network* maintained by a cellular service provider. Ex. 1018, ¶ [0034]. Furthermore, a POSITA would have understood that the LAN between the wireless devices would have been either a *private* (e.g. at home Wi-Fi network) or a *public wireless network* (e.g. an airport or conference center Wi-Fi network). Thus, Kotzin discloses this limitation.

X. SECONDARY CONSIDERATIONS

56. I have seen no evidence of, and I am not aware of any evidence of secondary considerations that have a nexus to the claimed inventions that would overcome the combinations of prior art cited above in showing the obviousness of the claims of the '641 Patent. The sheer number of independently developed, simultaneous inventions, developed within in a relatively short time-period are persuasive indicia of obviousness. However, should Patent Owner assert any secondary considerations of non-obviousness, I reserve the right to respond.

XI. CONCLUSION

57. For all the reasons discussed above, it is my opinion that each and every claim of the '641 Patent is invalid.

58. I hereby declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct, and that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I understand that willful false statements are punishable by fine or imprisonment or both. *See* 18 U.S.C. §1001.

Dated: August 5, 2025

Respectfully submitted,



Bill Lin