UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,

Petitioner

v.

QPRIVACY USA LLC,

Patent Owner

Case IPR2025-00837

Patent No. 11,106,824

DECLARATION OF DR. TIM A. WILLIAMS

TABLE OF CONTENTS

I. INTRODUCTION

1. I, Dr. Tim A. Williams, declare as follows:

2. My full name is Tim Arthur Williams.

3. I have been retained as an independent expert in this matter by counsel for Patent Owner QPrivacy USA LLC ("QPrivacy"). I have been asked to provide my opinions on certain issues in the above-identified *inter partes* review ("IPR") proceeding, IPR2025-00837, involving U.S. Patent No. 11,106,824 ("the '824 Patent" or "Challenged Patent"). I have reviewed the papers and exhibits in this IPR proceeding. I have reviewed other papers and exhibits cited and discussed herein.

4. I am being paid for my work preparing this declaration at my normal consulting rate plus reimbursement of direct expenses. My compensation is not tied to the outcome of this matter and is not based on the substance of the opinions that I provide.

II. QUALIFICATIONS

5. I am an industry professional with over 45 years of experience in wireless communications, computer networking and telecommunications technology. A copy of my CV is attached as Exhibit A.

6. I am currently active currently active as Chief Executive Officer at Beach Technologies, LLC (Danville, CA) a company related to intellectual property consulting.

7. I am also currently active as a Member at Calumet Venture Management (Madison, WI) a company related to the investment into start-up companies.

8. Beginning in 2004, I was the Founder and Chairman at DoceoTech Inc. (Danville, CA) which provides training for engineers in wireless, computer networking, and telephony technologies.

9. From 2008 to 2010, I was Founder and Board Member of BitRail Networks, Inc (Miami, FL). This company designed and produced computer networking equipment. One market the company served was edge devices for residential and community access.

10. From 2006 to 2015, I was Founder and Board Member of BEEcube, Inc. (Freemont, CA). This company built high speed computing and computer networking equipment. One market the company served was networking equipment for backhaul networks used in 5G cellular networks.

11. From 2004 to 2008, I was Founder and CEO of SiBEAM, Inc. This company designed and produced wireless networking IC and equipment.

12. From 1999 to 2000, I was Interim CEO and Advisory Board Member of Atheros Communications, Inc. (Palo Alto, CA) . This company designed and produced wireless networking IC and equipment.

13. From 1998 to 2000, I was CTO of Picazo Communications, Inc. (San Jose, CA). This company built computer networking equipment to provide VoIP PBX functionality.

14. From 1991 to 1998, I was Co-Founder, CTO, VP Engineering of Wireless Access, Inc. (Santa Clara, CA). This company developed over the air communication protocols for communication between the subscriber device and the network.

15. From 1979 to 1991, I was a Member of the Technical Staff at Motorola, Inc. (Schaumberg, IL and Austin, TX). In IL, I designed protocols for Digital voice communications. In TX, I designed ICs for communications including Telecom, Wireless, Cellular and Computer Networking.

16. I have been engaged in over 200 patent related litigations since 1999. Many of these cases relate to computer networking technologies, including protocols for Internet communications and the architecture of computer networks.

17. I hold degrees from Michigan Technological University (B.S.E.E., 1976) and the University of Texas at Austin (M.S.E.E., 1982 and Ph.D., Electrical Engineering, 1985 and M.B.A., 1991).

18. I am the principal inventor on 28 U.S. Patents all of which relate to communications technologies.

19. I have been a Registered Patent Agent since 2002.

III. LEGAL PRINCIPLES

20. When interpreting a patent, it is my understanding that it is important to view the disclosure and claims of that patent from the level of ordinary skill in that art at the time of the invention. I understand that Petitioner proposed a person of ordinary skill in the art ("POSA") would be an individual who, as of April 9, 2017, would have had "a bachelor's degree in computer science, computer engineering, or an equivalent, and three years of professional experience relating to packet-based network communications" and that a POSA "would have had a working knowledge of the data communications art… including packet-based computer networking" and "would be familiar with a variety of computer and internet networking topics such as the World Wide Web and TCP/IP." Petition at 11. I have been informed by counsel for QPrivacy that I should use Petitioner's proposed POSA definition for my analysis in this declaration.

21. Based on the foregoing, I believe that I am qualified to provide reliable opinions in the technical field of the Challenged Patent, including regarding what a POSA would have understood from the specification, drawings,

claims, and file histories, as well as from the prior art in the field at the time of the invention.

22. When offering opinions about how a POSA would evaluate or understand a particular issue, I have placed myself in the mindset of such a POSA, basing my opinions on the relevant education and skillset of such a POSA.

A. ANTICIPATION

23. It is my understanding that "anticipation" exists only if a single alleged prior art reference discloses each and every limitation of the claim at issue, either expressly or inherently. In other words, every limitation of the claim must appear in a single prior art reference for the reference to anticipate that claim. I also understand that all limitations of the claim must be disclosed in the reference as they are arranged in the claim. I also understand that a requirement of a claim that is missing from a prior art reference may be disclosed inherently if that missing requirement is necessarily present in the prior art. I also understand that to be considered anticipatory, the prior art reference must be enabling and must describe the patentee's claimed invention with sufficient specificity to have placed it in the possession of a POSA. I also understand that a POSA must be able to at once envisage the claimed invention based on the prior art reference without any need for picking, choosing, and combining various disclosures.

B. OBVIOUSNESS

24. I also understand that a patent claim may be rendered "obvious" based on an alleged prior art reference or a combination of such references plus what a POSA would understand based on his or her knowledge. It is also my understanding that in assessing the obviousness of claimed subject matter a POSA should evaluate obviousness of the claim as a whole from the perspective of one of ordinary skill in the art at the time the invention was made (and not from the perspective of either a layman or a genius in that art).

25. It is my further understanding that the question of obviousness is to be determined based on:

a. The scope and content of the prior art;

b. The difference or differences between the subject matter of the claim and the prior art (whereby in assessing the possibility of obviousness one should consider the manner in which a patentee and/or a Court has construed the scope of a claim);

c. The level of ordinary skill in the art at the time of the alleged invention of the subject matter of the claim; and,

d. Any relevant objective factors (the "secondary indicia") indicating non-obviousness as I discuss further below.

26. It is also my understanding that the United States Supreme Court clarified the law of obviousness in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. at 398 and 419 (2007) case ("KSR"), which I have read and incorporate herein by reference. Based on KSR, it is my understanding that to determine whether it would have been obvious to combine known limitations in a manner claimed in a patent, one may consider such things as the interrelated teachings of multiple patents, the effects of demands known to the design community or present in the marketplace, and the background knowledge of a POSA.

27. It is my further understanding that for a claim to be found invalid as obvious, it must be obvious to a POSA at the relevant time. I also understand that the existence of each and every limitation of the claimed invention in multiple prior art references/systems does not necessarily prove obviousness since most, if not all, inventions rely on building blocks of prior art. Obviousness may be found where the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which said subject matter pertains.

28. It is my further understanding that I should consider whether there was a reason that would have prompted a POSA to combine the known limitations in a way the claimed invention does, taking into account such factors as: (1) whether the claimed invention was merely the predictable result of using prior art

limitations according to their known function(s); (2) whether the claimed invention provides an obvious solution to a known problem in the relevant field; (3) whether the prior art teaches or suggests the desirability of combining limitations claimed in the invention; (4) whether the prior art teaches away from combining limitations in the claimed invention; (5) whether it would have been obvious to try the combinations of limitations, such as when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions; and (6) whether the change resulted more from design incentives or other market forces. I also understand that to render a claim obvious, the cited combination of prior art must provide a reasonable expectation of success for the proposed combination.

29. It is also my understanding that in developing opinions as to whether or not certain claimed subject matter would have been obvious, each claim of a given patent should be considered in its entirety and separately from any other claims. In so doing, it is my understanding that while I should consider any differences between the claimed invention and the prior art, I should also assess the obviousness or non-obviousness of the entirety of a claim covering an alleged invention, not merely some portion of it.

30. It is my further understanding that although the KSR decision I identified above has led to the elimination of the "teaching, suggestion or

motivation" test as the sole test for judging whether the prior art can be combined for the purposes of an obviousness assertion, the use of "impermissible hindsight" is still inappropriate when making such an assertion. For example, § 2142 of the Manual of Patent Examining Procedure ("MPEP") includes a specific direction to Patent Examiners that: "[t]he tendency to resort to "hindsight" based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art." In my opinion, this direction to Examiners is equally applicable to experts who assert that the general knowledge of a POSA and/or a combination of references invalidates a patent claim through obviousness.

31. I have also been informed that in cases such as the decision *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), the Court of Appeals for the Federal Circuit (the "CAFC") has stated that, "[c]are must be taken to avoid hindsight reconstruction by using the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit." In my opinion, this is also important because, as the Supreme Court also stated in KSR at pp. 418-19, "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to

look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known."

32. Additionally, and also relevant to the above caution to avoid hindsight, it is my understanding that it is not enough to find that prior art references could be combined, and that to show obviousness one must prove that a POSA would actually combine the multiple references to arrive at the claimed invention, including showing that a POSA would be motivated to do so. For example, in the case *PersonalWeb Technologies, LLC v. Apple, Inc.*, 848 F.3d 987, 994 (Fed. Cir. 2017), the Federal Circuit clarified that "obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention." (Emphasis in original.)

33. It is also my understanding that I should consider any secondary considerations that may shed light on the non-obviousness of the claims, such as:

a. Whether the invention was commercially successful as a result of the merits of the claimed invention (rather than the result of design needs or market-pressure advertising or similar activities);
b. Whether the invention satisfied a long-felt need;
c. Whether others had tried and failed to make the invention;
d. Whether others invented the invention at roughly the same time;
e. Whether others copied the invention;
f. Whether there were changes or related technologies or market needs contemporaneous with the invention;
g. Whether the invention achieved unexpected results;
h. Whether others in the field praised the invention;
i. Whether persons having ordinary skill in the art of the invention expressed surprise or disbelief regarding the invention;
j. Whether others sought or obtained rights to the patent from the patent holder; and,
k. Whether the inventor proceeded contrary to accepted wisdom in the field.

IV. CLAIM CONSTRUCTION

34. I understand that Petitioner proposed all claim terms should be given their "ordinary and customary meaning." Petition at 12. I use the plain and ordinary meaning of claim terms for my analysis in this declaration.

V. GROUND 1: BURNS + YANG

35. Ground 1 challenges claims 17-20 of the '824 Patent as allegedly obvious over the proposed combination of Burns and Yang. I have reviewed the prior art references relied on in Ground 1, namely Burns (EX. 1005) and Yang (EX. 1006).

A. THE PROPOSED COMBINATION

36. Petitioner alleges that a POSA would have been motivated to use Yang's static port mapping technique in Burns' IDS to identify an application/protocol associated with the packet flow. Petition at 21-23. I disagree.

37. Petitioner specifically points to Yang's disclosure of Table 1, showing ports and corresponding applications/protocols. Petitioner alleges that because Burns' IDS would be able to see the port in the TCP header, Burns' IDS using Yang's static port mapping technique would be able to determine the application/protocol associated with the packet flow.

TABLE I

PORT	APPLICATION
20	FTP
22	SSH
23	Telnet
25	SMTP
43	WHOIS
53	DNS
67	BOOTP or DHCP
70	Gopher
79	Finger
80	HTTP
109	POP
110	POP3
113	ident/IRC
118	SQL
119	NNTP
194	IRC
443	HTTPS
445	SMB
564	RTSP

EX. 1006 at 10:5-24

38. In my opinion, a POSA would not be motivated to use Yang's static port mapping technique because Yang itself states that "many hackers or other malicious individuals utilize software application that employ dynamic or randomized port assignments rather than conform to the static port assignments in order to evade detection and containment" that "[s]uch techniques render it difficult for IDSs to correctly identify the type of application and protocol." EX. 1006 at 1:36-42. Therefore, a POSA would not have been motivated to use Yang's static port mapping technique to identify and filter malicious packets. As Yang explains, hackers do not use static port assignments.

39. Additionally, I understand that the prior art must be evaluated from the perspective of a POSA at the time of invention (April 9, 2017). In my opinion, a POSA would have understood that, by 2017, Yang's static port mapping technique had become obsolete due to the use of port 443/HTTPS for Internet communications.

40. For example, in 2010, Steve Jobs wrote an article titled "Thoughts on Flash" emphasizing the shift using plugins like Flash to modern technology standards such as HTML 5.[1] This shift is significant because more applications were being developed for web browsers for use on mobile phones, tablets, etc. This shift is also evidenced by the rise of Google's Chrome OS that works with web-based applications like Gmail, Google Drive, etc.[2]

41. As web-based activity increased, developers like Apple and Google also increased security requirements to protect users. For example, the use of SSL/TLS certificates and HTTPS became normalized by 2017.

42. In 2014, Google started its campaign called "HTTPS Everywhere" and encouraged the use of HTTPS by default.[3] In 2016, Google announced it

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[1] See https://web.archive.org/web/20100503010500/http://www.apple.com/hotnews/thoughts-on-flash/ (EX. 2027)
[2] See https://arstechnica.com/information-technology/2010/01/chrome-os-interview-1/ (EX. 2028)
[3] See https://security.googleblog.com/2014/08/https-as-ranking-signal_6.html (EX. 2029)

would start implementing warning messages displaying "not secure" if a webpage with sensitive input fields (e.g., password or credit card number) was using HTTP.[4] Google also announced that it would eventually show warning messages for all websites using HTTP instead of HTTPS. By 2016, the majority of web traffic had already transitioned to HTTPS.[5]

43. With these developments in mind, namely the increase in web-based activity on mobile devices and the increase in HTTPS, a POSA would have understood that using a port to identify an application is not useful. For at least these reasons, in my opinion, a POSA would not have been motivated to use Yang's static port mapping technique in Burns' IDS as proposed.

B. CLAIM LIMITATION 17.10

44. Claim limitation [17.10] recites "wherein the content of the at least one data packet is not read by the remote server for continued operation by the user's device in real time during communication between the remote server and the user's device." I disagree with Petitioner's allegations regarding claim limitation [17.10].

[4] See https://developer.chrome.com/blog/avoid-not-secure-warn (EX. 2030) and https://security.googleblog.com/2016/09/moving-towards-more-secure-web.html (EX. 2031)
[5] https://wp-rocket.me/blog/googles-enforcing-https-website-ready-chrome-68/ (EX. 2032)

45. Petitioner primarily relies on its expert in its analysis of claim limitation [17.10]. Petition at 38-40. Petitioner alleges that it would have been obvious for Burns' IDS to perform the determination "in real time." Petition at 38-40.

46. Petitioner's citation to Yang is taken out of context. Yang discloses: "Once configured, IDS **20** monitors network traffic **24** (**72**). In some configurations, stateful inspection engine **28** of forwarding plane **22** may receive network traffic and mirror the network traffic for purposes of analysis. Forwarding component **31** seamlessly forwards the original network traffic. In other embodiments, traffic is not mirrored, rather a line-rate buffering approach is used to analyze the traffic in real-time prior to forwarding." EX. 1006 at 11:63-12:3. In my opinion, a POSA reading Yang would have understood that Yang distinguishes its mirrored approach from its line-rate buffering approach where the line-rate buffering approach analyzes traffic in "real-time" as that term is used in Yang. A POSA reading Yang would have understood that Yang's mirrored approach does not analyze traffic in "real-time" as that term is used in Yang.

47. Burns repeatedly refers to using the mirrored approach. *See, e.g., id.;* EX. 1005 at 10:18-22 ("…stateful inspection engine 28 of forwarding plane 22 may receive network traffic and mirror the network traffic for purposes of analysis…") and 11:63-67 (same). As discussed above, Yang teaches that the

disclosed mirrored approach does not analyze network traffic in "real-time" as that term is used in Yang.

48. Burns' IDS performs its analysis on mirrored packets (e.g., reconstructed, reassembled, copied data). *See, e.g.,* EX. 1005 at 7:65-8:02 (discussing reassembly module 50) and 8:11-34 (same); *see also, e.g.,* EX. 1006 at 8:27-32 (discussing reassembled application-layer communications 32) and 8:49-51 (same) and 9:14-18 (same). A POSA would have understood that the disclosed mirrored approach analyzes the mirrored packets instead of analyzing the original packets.

49. Burns states that the IDS "transparently monitors inbound network traffic 24 and forwards the network traffic as outbound network traffic 26." EX. 1005 at 6:30-36. However, in my opinion, this statement does not inform a POSA that Burns' IDS performs the determination in real-time as claimed. In computer networking, "transparently" means invisibly or unknowingly. For example, the IDS' monitoring might be described as transparent because the user is not actively involved and/or because the user does not know the specific details of the monitoring/analyzing. As another example, the IDS' monitoring might be described as transparent because the IDS is in-line with the destination device and the IDS intercepts network traffic without requiring changes to the destination IP address.

50. Petitioner states that "[m]ost commercial network intrusion detection systems run in real-time." Petition at 40 (citing EX. 1036 at 38). However, Petitioner fails to acknowledge that a POSA would have understood that there is a distinction between an intrusion detection system (detects possible intrusion) and an intrusion prevention system (detects possible intrusion and takes proactive steps to prevent intrusion). *See, e.g.,* EX. 1017 at 238. Neither Petitioner nor its expert address this distinction.

51. In my opinion, for at least these reasons, Petitioner fails to establish claim 17 would have been obvious.

VI. GROUND 2: BURNS + YANG + WITTENBERG

52. Ground 2 challenges claims 1-16 of the '824 Patent as allegedly obvious over the proposed combination of Burns, Yang, and Wittenberg. For at least these reasons discussed above with respect to Ground 1, Ground 2 fails. In my opinion, a POSA would not have been motivated to combine Burns and Yang as proposed and for at least the same reasons, a POSA would not have been motivated to combine Burns, Yang, and Wittenberg as proposed. Also, Petitioner relies on its analysis of claim limitation [17.10] in Ground 1 for its analysis of the similar limitations in claims 1 and 9 in Ground 2. Petitioner does not allege that Wittenberg cures any of the deficiencies discussed above with respect to Ground 1. Below I discuss additional reasons why Ground 2 fails.

A. CLAIM LIMITATIONS 1.8-1.9

53. Claim limitations [1.8] – [1.9] recite "modifying data packets corresponding to requests for sharing of responses that are not compatible with the received privacy preference; and maintaining communication between the remote server and the user's device, with sharing of the modified data packets." Petition at 55, 67-68; see also Petition at 44-46. I disagree with Petitioner's allegations regarding claim limitations [1.8] – [1.9].

1. Dropping the packets associated with the communication session

54. Burns discloses: "In addition, stateful inspection engine 28 may take additional actions, such as dropping the packets associated with the communication session…" EX. 1005 at 7:47-51.

55. Claim 8 of the '824 Patent recites: "The method of claim 7, wherein the modification of the at least one modified data packet is selected from the group consisting of … blocking …"

56. Petitioner alleges that Burns' dropping the packets associated with the communication session discloses blocking the at least one data packet. Petition at 45. Petitioner fails to establish that "dropping" is synonymous with "blocking" in the context of the '824 Patent. In my opinion, a POSA would have understood that "dropping" packets and "blocking" packets have different meanings including for

example whether the sender is notified. Petitioner and its expert fail to address this distinction.

57. Additionally, Burns discloses dropping all packets associated with the communication session if a security risk is detected. EX. 1005 at 7:45-50. If all packets are dropped, there is no sharing of the dropped packets as required by claim 1.

58. Petitioner does not address the "sharing" step of claim 1 in the petition itself. Petition at 55. Petitioner only cites to the expert declaration, EX. 1003 at ¶¶ 191-194. I disagree with Petitioner's expert's testimony to the extent that testimony is incorporated by reference into the petition.

59. I disagree that Burns' logging information about the communication session discloses sharing the modified communication as required by claim 1. EX. 1003 at ¶ 193. Burns discloses that "logging" means "security management module 44 records the source port, destination port, source IP address, destination IP address, time of discovery, packet size, a copy of the packet, other actions taken in response to the detection, or any other information that administrator 42 may find useful." EX. 1005 at 20:60-65. Logging this information, even including a copy of the packet, does not satisfy sharing the modified communication as claimed. The logged copy of the packet would not be "modified" in any way.

60. Additionally, the logging is performed by security management module 44 which is part of IDS 20. *See, e.g.*, EX. 1005 at FIG. 2. Therefore, there is no sharing by the IDS.

2. Automatically closing the communication session

61. Burns discloses: "In addition, stateful inspection engine 28 may take additional actions, such as … automatically closing the communication session…" EX. 1005 at 7:47-51.

62. Petitioner alleges that Burns discloses automatically closing the communication session and that it would have been obvious to set a FIN flag value in the TCP Header in order to do so. Petition at 45.

63. In my opinion, a POSA would not have been motivated to set a FIN flag value in the TCP Header in order to close the communication session in response to a detected security risk. The use of a FIN flag is for mutually terminating a connection when there is no more data to transmit. A POSA would not use a FIN flag to close a connection with an attacker.

64. Tanenbaum explains: "To release a connection, either party can send a TCP segment with the *FIN* bit set, which means that it has no more data to transmit. When the *FIN* is acknowledged, that direction is shut down. Data may continue to flow indefinitely in the other direction, however. When both directions have been shut down, the connection is released. Normally, four TCP segments are

needed to release a connection, one *FIN* and one *ACK* for each direction. However, it is possible for the first *ACK* and the second *FIN* to be contained in the same segment, reducing the total count to three." EX. 1012 at 530. In the context of Burns, an attacker would never acknowledge the first FIN and an attacker would never send a second FIN. Even if an attacker received the first FIN, the attacker may continue to send unwanted/malicious packets. Sending a first FIN does not "automatically" close the communication session.

65. In my opinion, Burns does not inherently disclose modifying the TCP Header to automatically close the communication session and Petitioner does not explain why a POSA would be motivated to, specifically, modify the TCP Header to automatically close the communication session. Additionally, Petitioner does not explain why a POSA would be motivated to, specifically, add a FIN flag to the TCP Header to automatically close the communication session. There are many alternative ways a POSA might automatically close the communication session. For example, a POSA may close the socket thereby terminating the associated connection. As another example, a POSA may drop all packets associated with the connection which would eventually cause the connection to time out and close.

3. Throttling down the communication session

66. Burns discloses: "Administrator 42 may also configure IDS 20 to throttle down (i.e., bandwidth limit) the communication session associated with the

packets to minimize the bandwidth used by the communication session." EX. 1005 at 10:6-9.

67. Petitioner alleges that Burns discloses throttling down the communication session and that it would have been obvious to modify the "TCP congestion window size" in a TCP Header in order to do so. Petition at 46.

68. In my opinion, a POSA would have been familiar with "TCP congestion window size" which is different from "TCP reception window size" as those phrases are used by Petitioner. When Petitioner uses the phrase "TCP reception window size," Petitioner appears to be referring to the window size specified by the receiver and advertised to the sender. EX. 1012 at 536-537. The "TCP reception window size" is advertised by the receiver to the sender in a TCP Header. EX. 1011 at 15 (Figure 3 showing TCP Header Format). This advertisement prevents buffer overflow at the receiver. EX. 1011 at 42; EX. 1012 at 536-537. As further explained by Tanenbaum, there may still be problems due to internal network congestion that need to be addressed by TCP congestion control algorithms. EX. 1012 at 536-537. To avoid problems related to receiver capacity and network capacity, the sender maintains two windows: (1) the window the receiver has advertised (rwnd) and (2) the congestion window (cwnd). EX. 1012 at 536-537.

69. Tanenbaum explains the slow start algorithm for the congestion window size: "When a connection is established, the sender initializes the congestion window to the size of the maximum segment in use on the connection. It then sends one maximum segment. If this segment is acknowledged before the timer goes off, it adds one segment's worth of bytes to the congestion window to make it two maximum size segments and sends two segments. As each of these segments is acknowledged, the congestion window is increased by one maximum segment size. When the congestion window is *n* segments, if all *n* are acknowledged on time, the congestion window is increased by the byte count corresponding to *n* segments. In effect, each burst successfully acknowledged doubles the congestion window. The congestion window keeps growing exponentially until either a timeout occurs or the receiver's window is reached." EX. 1012 at 538. The slow start algorithm is supported by all TCP implementations. Tanenbaum also explains the use of a threshold parameter in the Internet congestion control algorithm, which stops exponential growth once the threshold is hit. A POSA would have understood that the "TCP congestion window size" is maintained independently by the sender. The "TCP congestion window size" is not advertised by the sender to the receiver in a TCP Header.

70. In my opinion, Burns does not inherently disclose modifying the TCP Header to throttle down the communication session and Petitioner does not explain

why a POSA would be motivated to, specifically, modify the TCP Header to throttle down the communication session. Additionally, Petitioner does not explain why a POSA would be motivated to, specifically, change the window size in the TCP Header to throttle down the communication session. There are many alternative ways a POSA might throttle down the communication session. For example, a POSA may impose a limit on the number of packets accepted in a certain timeframe. This limit is enforced by not accepting the excess data. As another example, a POSA may slow down acknowledgements or send back false acknowledgements so that the sender must retransmit. As yet another example, a POSA may impose a limit on the number of packets sent/forwarded in a certain time frame.

71. In my opinion, for at least these reasons, Petitioner fails to establish claim 1 would have been obvious. Similar language is recited in claim 9. Therefore, for at least the same reasons, Petitioner fails to establish claim 9 would have been obvious. Petitioner does not allege that Wittenberg cures any of the deficiencies discussed above with respect to claims [1.8] – [1.9].

I declare that the foregoing is true and correct under penalty of perjury of the laws of the United States.

Signed in Danville, CA on 12 Aug 2025

EXHIBIT A

Tim Arthur Williams, Ph.D.
Curriculum Vitae

Dr. Williams has 45 years of professional experience in wireless communications, networking and telecom technology. He is an entrepreneur who has participated in the organization and operation of start up companies that brought wireless LAN, software VoIP PBX, and 2-way paging technology to the marketplace. Dr. Williams holds numerous patents in wireless and signal processing technology. He is an experienced litigation support consultant with experience in patent infringement matters. Dr. Williams is also a registered Patent Agent.

- Wireless LAN
- Cellular and PCS Standards
- Cellular Telephone Architecture
- Digital Signal Processing
- Telecommunications Technology
- VoIP Technology
- Computer Networking
- Wireless Networks & Protocols

Year	University	Degree
1991	University of Texas at Austin	MBA
1985	University of Texas at Austin	Ph.D., Dissertation: "Digital Signal Processing Techniques for Acoustic Log Data"
1982	University of Texas at Austin	MSEE, Thesis: "Cepstral Processing of Speech Signals"
1976	Michigan Technological University	BSEE

Tim Arthur Williams, Ph.D.
Curriculum Vitae

Professional Experience

From: 2008
To: 2010
Organization: Expressume, Inc / Montage Inc. – Milwaukee, WI
Title: Board Member
Summary: This company sells software for human resource recruiting. This company was sold in June 2019.

From: 2008
To: 2014
Organization: Faculte, Inc. – San Jose, CA
Title: Board Member
Summary: This company provided SaaS (Software as a Service) web video based communication products.

From: 2008
To: 2010
Organization: BitRail Networks Inc. – Miami, FL
Title: Founder, Board Member
Summary: This company sold computer networking solutions.

From: 2008
To: Present
Organization: Calumet Venture Management – Madison, WI
Title: Member
Summary: This company provides seed capital and management expertise to small companies.

From: 2006
To: 2015
Organization: BEEcube Inc. – Fremont, CA
Title: Founder, Board Member, Board Advisor
Summary: This company built high speed processing solutions. This company was sold to National Instruments, Inc. in Feb 2015.

From:	2006
To:	2015
Organization:	Topaz Equity, LLC – Danville, CA
Title:	Founder, Board Member
Summary:	This is a private equity investment company. It owned AtomAMPD which develops, markets and sells software based network solutions.

From:	2004
To:	Present
Organization:	DoceoTech Inc. – Danville, CA
Title:	Founder, Chairman
Summary:	This was a training company that provides training for engineers in Wireless, Networking, and Telephony technologies. It is currently owned by Beach Technologies, LLC.

From:	2004
To:	2006
Organization:	SiBEAM, Inc. – Sunnyvale, CA
Title:	Founder, Chief Executive Officer
Summary:	This is a fabless semiconductor company that develops high-speed wireless networking ICs. This company was sold to Silicon Image, Inc. in Apr 2011.

From:	2001
To:	2004
Organization:	JetQue, Inc. – Danville, CA
Title:	Founder, Chief Executive Officer
Summary:	This company created messaging solutions for the mobile professional.

From:	1999
To:	2000
Organization:	Atheros Communications, Palo Alto, CA
Title:	Interim CEO, Advisory Board Member
Summary:	This company builds wireless LAN ICs. Atheros became a public company in May 2004. (ATHR) This company was sold to QCOM in Jan 2011.

From:	1998
To:	2000
Organization:	Picazo Communications, Inc. – San Jose, CA
Title:	Chief Technology Officer, Advisory Board Member
Summary:	This company built and sold software PBXs Telephony equipment using VoIP and Circuit Switched Technologies. The company was purchased by Intel.

From:	1996
To:	Present
Organization:	Beach Technologies, LLC – Danville, CA
Title:	Chief Executive Officer
Summary:	This is a consulting company that provides IP services. It owns DoceoTech LLC and Streaming Knowledge LLC, which perform the same services.

From:	1991
To:	1998
Organization:	Wireless Access, Inc. – Santa Clara, CA
Title:	Co-Founder, Chief Technical Officer, Vice President of Engineering, Vice President of Business Strategy
Summary:	This was a startup company focusing on the Narrow Band PCS equipment market. The company developed the over the air protocols, the subscriber equipment and the ICs to deploy 2-way paging services. The company was sold to Glenarye Electronics.

From:	2014
To:	2021
Organization:	Through Technology, LLC. – Chicago, IL
Title:	Partner
Summary:	This is a private equity investment company. It owns Through Technology Group, PTE LTD, which is registered in Singapore.

From:	1979
To:	1991
Organization:	Motorola, Inc. – Austin, TX – Semiconductor Sector

Tim Arthur Williams, Ph.D.
Curriculum Vitae

Title: Sr. Engineer, Member Technical Staff, Sr. MTS

Summary: Business manager, project leader, and senior technical member of the teams which were responsible for product development of the following systems:

- ADPCM transcoder,
- ISDN U-reference point transceiver,
- CT-2 voice codec and channel modem,
- GSM voice codec and channel modem,
- TDMA voice codec and channel modem
- CDMA voice codec and channel modem, and
- Japanese Digital Cellular voice codec and channel modem.

From: 1976
To: 1979
Organization: Motorola Inc. - Chicago, IL - Communications Sector - Digital Voice Privacy Group
Title: Engineer
Summary: This group built the first commercial digitally encrypted two-way FM land mobile radio system.

Professional Certifications

- Patent Agent – U.S. Patent and Trademark Office #50,790 (Jan 2002)

Issued Patents

Patent	Date	Description
10,917,232	2021	Data Enciphering or Deciphering using a Hierarchical Assignment System
9,787,471	2017	Data Enciphering or Deciphering using a Hierarchical Assignment System
7,904,117	2011	Wireless Communication Device using Adaptive Beamforming
6,781,962	2004	Apparatus and Method for Stored Voice Message Control
6,600,481	2003	Data entry apparatus and method
6,088,457	2000	Method and apparatus for over the air programming a communication device
5,854,595	1998	Communications apparatus and method with a computer interchangeable integrated circuit card
5,557,642	1996	Direct conversion receiver for multiple protocols

5,428,638	1995	Method and apparatus for reducing power consumption in digital communications devices
5,345,406	1994	Bandpass sigma delta converter suitable for multiple protocols
5,101,344	1992	Data processor having split level control store
5,001,661	1991	Data processor with combined adaptive LMS and general multiplication functions
4,989,169	1991	Digital tone detector using a ratio of two demodulators of differing frequency
4,972,356	1990	Systolic IIR decimation filter
4,965,762	1990	Mixed size radix recoded multiplier
4,947,363	1990	Pipelined processor for implementing the least-mean-squares algorithm
4,876,542	1989	Multiple output oversampling A/D converter with each output containing data and noise
4,862,169	1989	Oversampled A/D converter using filtered, cascaded noise shaping modulators
4,843,585	1989	Pipelineable structure for efficient multiplication and accumulation operations
4,843,390	1989	Oversampled A/D converter having digital error correction
4,796,219	1989	Serial two's complement multiplier
4,737,925	1988	Method and apparatus for minimizing a memory table for use with nonlinear monotonic arithmetic functions
4,734,876	1988	Circuit for selecting one of a plurality of exponential values to a predetermined base to provide a maximum value
4,727,508	1988	Circuit for adding and/or subtracting numbers in logarithmic representation
4,722,067	1988	Method and apparatus for implementing modulo arithmetic calculations
4,682,302	1987	Logarithmic arithmetic logic unit
4,618,946	1986	Dual page memory system having storage elements which are selectively swapped between the pages
4,406,010	1983	Receiver for CVSD modulation with integral filtering
4,398,262	1983	Time multiplexed n-ordered digital filter

Patent Applications and Continuation Applications

Appl. Num.	Pub. Date	Description
20070037528	2007	Wireless Communication Device using Adaptive Beamforming
20040252679	2004	Stored Voice message Control Extensions

Published Papers

6 Sept 2016 Putnam, Jonathan D. and Williams, Tim A., The Smallest Salable Patent-Practicing Unit (SSPPU): Theory and Evidence.
Available at SSRN: https://ssrn.com/abstract=2835617

19 Sept 2022 Williams, Tim A, A Study of IPlytics Standard Essential Patent Tool.
Available at SSRN: https://ssrn.com/abstract= 4223782

Litigation Experience

See attached.