

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

**SAMSUNG ELECTRONICS CO., LTD. AND
SAMSUNG ELECTRONICS AMERICA, INC.,**
Petitioners

v.

MAXELL, LTD.,
Patent Owner

Inter Partes Review No.: IPR2025-01307

**DECLARATION OF MICHAIL BLETSAS IN SUPPORT OF
PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 11,026,088**

I hereby declare under penalty of perjury under the laws of the United States of America that the following 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 under Section 1001 of Title 18 of the United States Code.

Date: 06/30/2026



MICHAIL BLETSAS

U.S. Patent No. 11,026,088

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EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 11,026,088
1002	File History of U.S. Patent No. 11,026,088
1003	Declaration of Joseph A. Paradiso in Support of Petition for <i>Inter Partes</i> Review of U.S. Patent No. 11,026,088
1004	U.S. Patent Publication No. 2019/0053149 ("Twami")
1005	Certified Translation of Japanese Application No. 2014-024016
1006	U.S. Patent Publication No. 2007/0005788 ("Kim")
1007	Certified Translation of Korean Application No. 10-2003-0065676
1008	U.S. Patent Publication No. 2013/0147900 ("Weiser")
1009	U.S. Patent Publication No. 2015/0007302 ("Kato")
1010	Certified Translation of Japanese Application No. 2013-134145
1011	Certified Translation of Japanese Application No. 2014-006624
1012	U.S. Patent No. 9,323,713 ("Liansky")
1013	U.S. Patent Publication No. 2005/0036509 ("Acharya")
1014	U.S. Patent Publication No. 2014/0233443 ("Kumar")
1015	U.S. Patent Publication No. 2004/0267981 ("Kakemura")
1016	U.S. Patent Publication No. 2015/0327310 ("Miura")
1017	U.S. Patent Publication No. 2010/0323682 ("Hatayama")
1018	U.S. Patent Publication No. 2013/0221084 ("Doss")
1019	Microsoft Computer Dictionary (5th ed. 2002)
1020	Newton's Telecom Dictionary (30th ed. 2016)
1021	U.S. Patent No. 6,636,499 ("Dowling")
1047	DLNA Wikipedia
1048	Transcript of Deposition of Dr. Pachamanov dated June 17, 2026
1049	Declaration of Michail Bletsas in Support of Petitioner's Reply in <i>Inter Partes</i> Review of U.S. Patent No. 11,026,088
1050	Wi-Fi Display Technical Specification Version 1.1
1051	IEEE Standard for Information technology 802.11h-2003: Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications Amendment 5: Spectrum and Transmit Power Management Extensions in the 5 GHz band in Europe
1052	IEEE Standard for Information technology 802.11y-2008: Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 3: 3650–3700 MHz Operation in USA

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Exhibit No.	Description
1053	IEEE Standard for Information technology 802.11z-2010: Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 7: Extensions to Direct-Link Setup (DLS)
1054	Transactions on Communications, VOL. COM-22, NO. 5, May 1974; "A Protocol for Packet Network Intercommunication," Vinton G. Cerf and Robert E. Icahn
1055	RFC 793: Transmission Control Protocol, DARPA Internet Program Protocol Specification, September 1981
1056	RFC 2988: Computing TCP's Retransmission Timer, V. Paxson and M. Allman, November 2000
2001	Notice Letter to Samsung (July 7, 2021)
2002	Follow-up Notice Letter to Samsung (December 29, 2021)
2003	Docket Navigator Time to Trial Statistics for the Eastern District of Texas
2004	Docket Control Order, Maxell, Ltd. v. Samsung Elecs. Co., Ltd., No. 5:25-cv-00052-RWS (E.D. Tex.)
2005	Jury Trial Transcript, Vol. 4, Maxell, Ltd. v. Samsung Elecs. Co., Ltd., No. 5:23-cv-00092-RWS (E.D. Tex.)
2006	Complaint, Maxell, Ltd. v. Samsung Elecs. Co., Ltd., No. 5:25-cv-00052-RWS (E.D. Tex.)
2007	Follow-up Notice Letter to Samsung (April 21, 2025)
2008	Law360 Article, "Maxell Settles Patent Suit Against Apple Over Mobile Tech"
2009	Law360 Article, "Maxell Scores \$43M EDTX Jury Win In ZTE Patent Trial"
2010	Law360 Article, "Maxell, Huawei Reach Terms To End Smartphone Patent Suit"
2011	Hudson Institute Article, "Google's Loss to Sonos Settles It, Big Tech Has an IP Piracy Problem"
2012	PatentRenewal.com Article, "which-companies-hold-the-most-patents-in-the-world"
2013	Motion for Partial Summary Judgment of Validity Based on Sotera Stipulations, Maxell, Ltd. v. Samsung Elecs. Co., Ltd., No. 5:23-cv-00092-RWS (E.D. Tex.)
2014	Declaration of Dr. Radostin Pachamanov in Support of Patent Owner's Response

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Exhibit No.	Description
2015	Transcript of March 27, 2026 Deposition of Dr. Joseph A. Paradiso

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TABLE OF CLAIMS

[1pre] A communication system comprising:
[1a] a communication device;
[1b] an access point device;
[1c] a first communication terminal configured to connect to the communication device via the access point device and transmit a command to remotely control a display operation on the communication device connected with the first communication terminal; and
[1d] a second communication terminal configured to, if having permission from the first communication terminal, establish a connection with the communication device to use the communication device;
[1e] wherein, while the communication device outputs data received from the second communication terminal that has established the connection with the communication device and upon receiving, by the communication device, the command from the first communication terminal, the communication device is configured to control how to display the data received from the second communication terminal while maintaining the connection with the second communication terminal, and
[1f] wherein, when the communication device receives information to terminate the permission from the first communication terminal, the communication device is configured to terminate the connection with the second communication terminal in accordance with the information to terminate permission received from the first communication terminal.
[2pre] The communication system according to claim 1, wherein,
[2a] for the permission, the first communication terminal transmits, to the second communication terminal, connection information necessary for a connection through short range communication with the second communication terminal, and the second communication terminal connects to the communication device by using the connection information.
[3pre] The communication system according to claim 1, wherein,
[3a] the communication device performing communication with the first communication terminal at predetermined time intervals for confirming whether to continue or terminate the permission for the second communication terminal to connect to the communication device, after the connection to the second communication terminal, and continuing the connection with the second communication terminal upon confirming the permission is to be continued, while terminating the connection with the second communication terminal upon confirming the permission is to be terminated.

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[4pre] The communication system according to claim 1, wherein,
[4a] the first communication terminal confirming, with a user at the predetermined time intervals, whether to continue or terminate the permission for the second communication terminal to connect to the communication device, after the connection to the second communication terminal, and transmits information indicating termination of the permission to the communication device upon confirming the permission is to be terminated, and upon receiving the information indicating termination of the permission, the communication device terminating the connection with the second communication terminal.
[5pre] The communication system according to claim 1, wherein,
[5a] the first communication terminal displays information whether to terminate the permission on a display screen,
[5b] receives an input operation for terminating the permission, and transmits the information to terminate the permission to the communication device in accordance with the input operation for terminating the permission.
[6pre] The communication system according to claim 1, wherein,
[6a] in a case that the communication device is able to receive information from the first communication terminal, the communication device controls the communication device in accordance with information from the first communication terminal,
[6b] wherein, in a case that the communication device is unable to receive information from the first communication terminal, the communication device terminates the connection with the second communication terminal.
[7pre] The communication system according to claim 1, wherein,
[7a] for the permission, the first communication terminal transmits, to the second communication terminal, connection information necessary for a connection through short range communication with the second communication terminal, and
[7b] the second communication terminal transmits address information on the second communication terminal to the first communication terminal,
[7c] the first communication terminal transmits the address information on the second communication terminal to the communication device,
[7d] the communication device registers the address information on the second communication terminal into a permission list,
[7e] the second communication terminal connects to the communication device by using the connection information,
[7f] upon confirming the permission is to be terminated, the first communication terminal causes the communication device to delete the address information on

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the second communication terminal from the permission list of the communication device, and,
[7g] upon the address information on the second communication terminal being not registered in the permission list, the communication device terminates the connection with the second communication terminal.
[8pre] The communication system according to claim 1, wherein,
[8a] for the permission, the first communication terminal transmits, to the second communication terminal, connection information necessary for a connection through short range communication with the second communication terminal, and
[8b] the second communication terminal transmits address information on the second communication terminal to the first communication terminal,
[8c] the first communication terminal registers the address information on the second communication terminal into a permission list,
[8d] the second communication terminal connects to the communication device by using the connection information,
[8e] upon confirming the permission is to be terminated, the first communication terminal causes the communication device to delete the address information on the second communication terminal from the permission list, and
[8f] the communication device performs communication for confirmation with the first communication terminal and,
[8g] upon the address information on the second communication terminal being not registered in the permission list of the communication device, terminates the connection with the second communication terminal.
[9pre] The communication system according to claim 1, wherein,
[9a] for the permission, the first communication terminal requests a one-time password from the communication device, and the communication device responds with the one-time password,
[9b] the first communication terminal transmits, to the second communication terminal, connection information including the one-time password necessary for a connection through short range communication with the second communication terminal, and
[9c] the second communication terminal connects to the communication device by using the connection information including the one-time password.
[10pre] The communication system according to claim 1, wherein,
[10a] for the permission, the second communication terminal performs short range communication with the communication device,
[10b] the communication device transmits, to the second communication terminal, connection information necessary for a connection, and

[10c] the second communication terminal transmits address information on the second communication terminal to the communication device,
[10d] the communication device registers the address information on the second communication terminal into a permission list,
[10e] the second communication terminal connects to the communication device by using the connection information,
[10f] upon confirming the permission is to be terminated, the first communication terminal causes the communication device to delete the address information on the second communication terminal from the permission list of the communication device, and,
[10g] upon the address information on the second communication terminal being not registered in the permission list, the communication device terminates the connection with the second communication terminal.
[11pre] The communication system according to claim 1, wherein,
[11a] for the permission, the second communication terminal requests a one-time password from the communication device through short range communication with the communication device, and
[11b] the communication device transmits connection information including the one-time password necessary for a connection to the second communication terminal, and
[11c] the second communication terminal connects to the communication device by using the connection information including the one-time password.
[12pre] The communication system according to claim 1, wherein,
[12a] for the permission, the first communication terminal transmits, to the second communication terminal, connection information necessary for a connection through short range communication with the second communication terminal,
[12b] the second communication terminal connects to the communication device by using the connection information, and
[12c] in the short range communication, the first communication terminal displays a bar code representing the connection information on a display screen thereof and the second communication terminal captures an image of the bar code with a camera to read the connection information.
[13pre] The communication system according to claim 1, wherein,
[13a] the second communication terminal controls the communication device while maintaining the connection with the communication device, and
[13b] the first communication terminal controls the communication device while maintaining the connection with the communication device via the access point.
[14pre] A communication terminal comprising:

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[14a] a wireless connection interface configured to connect to a communication device via an access point device; and
[14b] a controller configured to control the wireless connection interface and to transmit a command to remotely control a display operation on the communication device connected with the communication terminal,
[14c] wherein the controller is configured to transmit permission to establish a connection for the communication device and another communication terminal,
[14d] wherein, while the communication device outputs data received from the another communication terminal that has established the connection with the communication device, the controller is configured to transmit the command to control how to display the data while the communication device and the another communication terminal are connected, and
[14e] wherein, when the controller transmits information to terminate the permission from the communication terminal, the controller is configured to transmit the information to terminate the connection with the another communication terminal to the communication device.
[15pre] A communication device comprising:
[15a] a wireless connection interface configured to connect to a communication terminal and another communication terminal; and
[15b] a controller configured to control the wireless connection interface,
[15c] wherein the wireless connection interface is configured to connect to the communication terminal via an access point device,
[15d] wherein the controller is configured to control to establish a connection with the another communication terminal, if having permission from the communication terminal, and control data received from the another communication terminal,
[15e] wherein, while the controller controls the data received from the another communication terminal and upon receiving at the wireless communication interface, from the communication terminal, a command to remotely control how the data received from the another communication terminal is displayed, the controller is configured to control the data received from the another communication terminal in accordance with the command from the communication terminal while maintaining the connection with the another communication terminal, and
[15f] wherein, when the wireless communication interface receives information to terminate the permission from the communication terminal, the controller is configured to terminate the connection with the another communication terminal.

I. INTRODUCTION

1. My name is Michail Bletsas. I have been asked by Petitioners Samsung Electronics Co. Ltd. and Samsung Electronics America, Inc. to provide my expert opinions in support of the above-identified petition for inter partes review of U.S. Patent No. 11,026,088 ('088 patent," EX1001), challenging the validity of claims 1, 2, and 5-15 (the "Challenged Claims").

2. In particular, I have been asked to provide an expert opinion on the question, raised by witness for Patent Owner ("PO") Dr. Pachamanov in his declaration (EX2014), whether any disruption at Layer-2 (Medium Access Control, or "MAC") of the Open Systems Interconnection (OSI) stack — using WiFi radios in this context — necessarily disrupts connectivity at Layer-4 (Transmission Control Protocol or "TCP"/User Datagram Protocol or "UDP" sessions). In summary, it is my opinion that the answer is no, as established both by the operating principles of the protocol stack and by the specific mechanisms defined in the governing IEEE 802.11 standards and described in the Iwami patent (EX1004). My detailed opinions on the claims are set forth below.

3. I am being compensated for my time at the rate of \$500 per hour. This compensation is not contingent upon my performance, the outcome of this matter, or any issues involved in or related to this matter.

II. BACKGROUND AND QUALIFICATIONS

A. Qualifications

4. All of my opinions stated herein are based on my own personal knowledge, professional judgment, and analysis of the materials and information I considered in preparing this Declaration. In forming my opinions, I have relied on my knowledge and experience in designing, developing, researching, and teaching the technology referenced in this Declaration.

5. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth herein. I have been informed that a copy of my current curriculum vitae, which details my education and professional and academic experience, is being submitted as Exhibit A. The following provides a brief overview of some of my experience that is relevant to the matters set forth in this Declaration.

6. I have over thirty years of experience in electrical and computer engineering. Currently, I am the Director of Computing and a Research Scientist at the Massachusetts Institute of Technology (MIT) Media Lab, where I manage the group responsible for the design, installation, operation and maintenance of the laboratory's extensive networking and computing infrastructure, keeping the Media Lab at the forefront of technology developments by ensuring that the latest relevant technologies are deployed at the Media Lab in the most cost-effective manner.

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7. I received my Electrical Engineering Degree from Aristotle University of Thessaloniki in 1989. I received my Master of Science in Computer Engineering from Boston University in 1991. From 1987-1990, I worked as a Support Engineer and Developer for ATKO Computer Systems S.A. in Thessaloniki, Greece. From 1993-1995, I worked as a Systems Engineer for AWARE Inc. in Bedford, Massachusetts. I co-founded and worked at Velti S.A. in Athens, Greece from 2000-2006, helping to build the first Greek technology company to complete a successful IPO on London's AIM stock exchange followed by a successful IPO on NASDAQ in 2011. As Founding Member, Chief Connectivity Officer, VP Advanced Technology of One Laptop per Child in Cambridge, Massachusetts from 2006-2009, I was a defining contributor to the design and engineering of the XO-1 laptop, generally credited as the patriarch of the "Netbook" category that transformed the personal computing industry.

8. My qualifications, publications, professional experience and expertise are set forth more fully in my curriculum vitae, attached as Appendix A.

B. Technology Background

9. The basic concepts of the TCP/IP protocol suite would have been well known prior to August 2014. Packet switching networks were well-developed by the 1970s (see EX1054, for example), with TCP being standardized by at least the early 1980s (see EX1055, for example). Wireless networking would have been

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similarly well known prior to August 2014, and a person of ordinary skill in the art ("POSITA") would have been familiar with the 802.11 standards defining common wireless networking techniques (see EX1050, EX1051, EX1052, and EX1053, for example).

C. Legal Standards

10. I have been asked to use the date of the filing of the earliest application to which priority is claimed as the date of invention for purposes of my analysis.

11. I have been informed by counsel for petitioner of the following legal standards, and I have applied these standards in forming my opinion.

12. I am informed and understand that a patent claim is invalid under 35 U.S.C. §102 if a prior art disclosure teaches every element required by the claim, either expressly or inherently. The identical invention must be shown in as complete detail as is contained in the claim. When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art.

13. I am informed and understand that a patent claim is invalid under 35 U.S.C. § 103 if the differences between the invention and the prior art are such that the subject matter as a whole would have been obvious at the time of the invention

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to a person having ordinary skill in the art to which the subject matter pertains.

Obviousness, as has been explained to me, is based on (i) the scope and content of the prior art, (ii) the differences between the prior art and the claim, (iii) the level of ordinary skill in the art, and (iv) any secondary indicia of non-obviousness (e.g., "secondary considerations" such as commercial success in the market place of the claimed invention), to the extent that they exist.

14. I further understand that obviousness may be demonstrated by showing that it would have been obvious to combine the teachings of more than one item of prior art. In determining whether a piece of prior art could have been combined with other prior art or with other information within the knowledge of a person having ordinary skill in the art, the following are examples of approaches and rationales that may be considered:

- Combining prior art elements according to known methods to yield predictable results;
- Simple substitution of one known element for another to obtain predictable results;
- Use of a known technique to improve similar devices (methods, or products) in the same way;
- Applying a known technique to a known device (method or product) ready for improvement to yield predictable results;

- Applying a technique or approach that would have been obvious to try (choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success);
- 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 would have been predictable to a person having ordinary skill in the art; and
- 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.

15. I further understand that an invention may be obvious if one of ordinary skill in the art, facing a wide range of needs created by developments in the field, would have seen an obvious benefit to the solutions tried by the applicant. When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, it may be obvious to a person of ordinary skill to try the known options. If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique would have been obvious.

16. I further understand that a person of ordinary skill in the art is a hypothetical person who is presumed to be aware of the relevant art at the time of the invention. The person of ordinary skill may be able to fit together the teachings of multiple patents and/or printed publications employing ordinary creativity and the common sense that familiar items may have uses in another context or beyond their primary purposes.

17. I also understand that when considering the obviousness of a patent claim, one should consider whether a teaching, suggestion, or motivation to combine the references exists, so as to avoid impermissibly applying hindsight when combining or modifying the prior art. I understand this test should not be applied rigidly, but that the test can be important to avoid such hindsight.

18. I also understand that one of ordinary skill in the art must have a reasonable expectation of success in combining or modifying prior art references.

19. I also understand that all elements of a claim must be considered in an obviousness analysis.

20. I understand that the standard to prove unpatentability in an inter partes review proceeding is by a preponderance of the evidence, which means more likely than not.

D. Other Materials Relied Upon

21. In forming the opinions set forth in this declaration, I have utilized my own experience and expertise, including regarding the knowledge and capabilities of a person of ordinary skill in the relevant art in the timeframe of the claimed priority date of the '088 patent.

III. LAYER-2 DISRUPTION AND LAYER-4 SESSION CONTINUITY IN WIFI

A. Overview

22. I have been asked to answer the question of whether any disruption at Layer-2 (MAC) of the OSI stack — using WiFi radios in this context — necessarily disrupts connectivity at Layer-4 (TCP/UDP sessions). The answer is no. This is established both by the operating principles of the protocol stack and by the specific mechanisms defined in the governing IEEE 802.11 standards and described in the Iwami patent.

B. General Principle: Sessions Persist Across Intermittent Loss

23. When dealing with packet communications, a communication session between two network nodes can persist even when the nodes cannot successfully exchange packets at every instant. This is the foundational principle of the TCP/IP protocol suite, which was specifically designed to establish and maintain sessions over unreliable communication channels. *See* EX1054 and EX1055, section 1.5. In

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the context of TCP over WiFi, the following points are essential. EX1055, section 1.5.

24. TCP cares about:

- Can I send packets?
- Do I receive acknowledgments (ACKs) from the receiver?
- Is the round-trip time reasonable?

25. TCP does not care about any WiFi operating parameter:

- Channel frequency and bandwidth
- Operating mode (associated with an AP, ad-hoc, or WiFi Direct)

26. A TCP session is identified solely by its connection 4-tuple: source IP address, source port, destination IP address, and destination port. As long as this 4-tuple remains valid and packets can eventually be exchanged, the session persists. The physical channel on which the underlying radio link happens to operate at any given instant is irrelevant to the existence of the session. EX1055, section 2.7.

C. The RTO Threshold Governs Whether a Disruption Is Even Visible

27. When a disruption occurs at Layer-2 — a WiFi channel switch, for example — its impact on Layer-4 depends entirely on its duration relative to the TCP Retransmission Timeout (RTO), the interval the sender waits for an acknowledgment before assuming loss and retransmitting. If the disruption is shorter than the RTO (typically a 200ms floor on Linux; an initial 1s per RFC

6298), it is invisible to TCP. No retransmission is triggered and the session is completely unaffected. EX1056, section 5. If the disruption exceeds the RTO, a retransmission occurs, but the session persists. TCP recovers as soon as connectivity is restored. EX1055, Section 3.7. If the disruption is prolonged, TCP enters exponential backoff, doubling the RTO with each successive failed retransmission. The session does not break immediately; TCP can tolerate disruptions of many seconds — and, depending on the operating system's retransmission limit, even minutes — before resetting. In practice, an application-layer timeout often fires before TCP itself gives up. EX1050, Section 6.5.1.

28. It is important to stress one necessary condition for this resilience: Layer-3 addressing must remain stable across the disruption. If the channel switch is accompanied by a change of IP address (or a change in routing that invalidates the path), the TCP session will break regardless of how fast the switch occurs, because the connection's 4-tuple is no longer valid. Conversely, where Layer-3 addressing is preserved, the session survives. EX1055, Section 3.2.

29. The behavior of UDP differs. Being connectionless, UDP maintains no retransmission or timeout state of its own. A brief Layer-2 disruption simply causes packet loss for the duration of the gap. Streaming applications absorb this through jitter buffers and error-concealment techniques, so session continuity for

UDP-based media is governed entirely by the application layer rather than by the transport layer. EX1050, Section 4.10.1, Figure 4.7.

D. WiFi Channel Switches That Preserve the Connection

30. In WiFi communications there are several well-established cases in which nodes switch channels without disrupting the higher-layer connection. The unifying requirement in each is that the switch is coordinated and that Layer-3 addressing is preserved. For mobile nodes, roaming between access points is the most familiar example of disruption-less channel switching — provided the node remains on the same IP subnet so that its IP address is preserved. The most common WiFi operating mode is a node (terminal) that associates with an access point. The establishment of this association signals to the upper layers that the link is active and that packets can be sent and received. In this mode, all packets flow through the access point. For media-streaming applications like those described in the patents, however, it is desirable for nodes to communicate directly with each other. WiFi Direct and Tunneled Direct Link Setup (TDLS) both enable such direct communication, and both include channel-switch methods specifically designed to minimize or avoid disruption to established sessions, provided their timing constraints are satisfied.

31. In TDLS, a media source sends to a sink (a display, for example) while both remain associated with the same access point. They exchange setup

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information via the AP and then the source streams media directly to the sink. For additional capacity, they may select a different channel for the direct link. In that case their radios time-share between the AP channel and the direct-link channel in a time-coordinated manner, without ever losing the association with the AP. This coordination is essential: each device periodically returns to the AP's channel to receive beacons, and it is precisely this timed return that preserves the association while the direct link operates off-channel. EX1053, Section 11.21.6.3.

32. In WiFi Direct, there is no AP in the negotiation. The nodes form a peer-to-peer group in which one device becomes the Group Owner (GO). The GO determines the group's operating channel and also acts as the DHCP server, so it anchors the Layer-3 addressing. The GO can change the operating channel via a Channel Switch Announcement (CSA), which notifies all clients in advance so they switch in a synchronized manner. Because the GO — and therefore the IP addressing — persists across the switch, established sessions are preserved. A node can be in WiFi Direct mode and concurrently associated with an access point; if the two channels differ, the node time-shares between them. EX1050, Section 4.14.

33. Both modes are examples of switching channels without Layer-4 disruption, so long as two conditions are met: (1) the timing constraints keep any disruption within TCP's tolerance, and (2) Layer-3 addressing remains stable throughout the switch.

E. Why the "Disruptive MAC Break" Argument Is Incorrect

34. Dr. Pachamanov argues that a channel change necessarily causes a disruptive break of the MAC-layer session, such that the connection cannot be "maintained" across a frequency-band switch. That argument rests on the traditional IEEE 802.11 infrastructure model (STA-to-AP, uncoordinated reassociation) and does not account for the coordinated mechanisms defined for channel switching and direct links, nor for the architectural possibilities expressly described in Iwami. EX2014, ¶¶128-131.

1. Dr. Pachamanov Omits the Coordinated Switch Mechanisms (CSA/ECSA and 802.11z)

35. Dr. Pachamanov relies on IEEE Std 802.11-2012, §10.3.5, to assert that a station must hold "State 4: Authenticated, Associated" to transmit data, and that moving to a new frequency forces a reassociation that drops that state. *Id.* But §10.3.5 describes only an uncoordinated reassociation — the scenario in which a station independently abandons its channel with no announcement. It is not the only path, and it is not the path a POSITA would have used here. The standard defines coordinated mechanisms whose entire purpose is to change the operating channel without terminating the association:

36. One coordinated mechanism is the Channel Switch Announcement (CSA). An AP or P2P Group Owner announces the target channel and a beacon

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count, and all associated stations move together. The association is maintained; there is no de-authentication or de-association. EX1051, Section 7.3.2.20.

37. Another coordinated mechanism is the Extended Channel Switch Announcement (ECSA). The ECSA element carries an Operating Class field, enabling an announced switch to a channel in a different frequency band (e.g., 2.4 GHz to 5 GHz) while the BSS and all associations persist. This directly addresses the low-band-to-high-band transition Dr. Pachamanov characterizes as impossible. EX1052, Section 7.3.2.53.

2. TDLS Provides the Very Continuity Dr. Pachamanov Says Is Unavailable

38. For direct links specifically, the TDLS specification (originally IEEE 802.11z, folded into 802.11-2012) provides exactly the continuity Dr. Pachamanov says is unavailable. Continuous association is provided by stations establishing a TDLS direct link remaining associated with the AP while transmitting frames directly to the peer. EX1053, Section 5.2.10. Off-channel operation is provided because when stations move off-channel for direct communication, they remain associated with their BSS and the BSSID is unchanged. EX1053, Section 11.21.6.1. Coordinated switching with fallback is also provided. Rather than a blind reassociation, TDLS uses a Request/Response handshake; if the off-channel switch fails, the devices automatically revert to the base channel, preserving their ability to communicate. EX1053, Section 11.21.6, Figure 11.17a.

3. Iwami Itself Forecloses the Argument

39. The Iwami patent describes capabilities that are incompatible with a mandatory "disruptive break."

40. One such capability is simultaneous and time-division connections across channels. Iwami expressly identifies "simultaneous connection of different frequency channels" and "time division connection of different frequency channels." EX1004, FIG. 38. This is an architecture in which a device maintains connectivity across channels rather than being forced to drop all connectivity to re-associate. If, as Dr. Pachamanov contends, any channel change necessarily terminated the connection, this disclosed and undisputed mode of operation would itself be impossible. His premise is therefore self-refuting.

41. Iwami also describes reuse of Layer-3/Layer-4 state across the switch. Iwami teaches that when the connection state is switched, the connection process is performed "using at least one of port information and IP information related to a connection before the switching" (EX1004, ¶ [0392]), and that it is possible to "divert a process such as IP acquisition ... and a port setting of real-time transport protocol (RTP)" (EX1004, ¶ [0314]). Carrying forward the IP and port state is precisely the condition under which a Layer-4 session is maintained. A reference that expressly preserves the connection's 4-tuple across a switch cannot be teaching

something that is "technically impossible" to perform while maintaining the connection.

42. Iwami also describes continuous streaming across the transition.

Iwami's stated objective is to optimize real-time streaming during transitions, and it teaches that switch-timing information is signaled to the sink so the stream continues across the change. EX1004, ¶ [0187].

4. Layer-4 Persists Even Through a Brief Layer-2 Reconfiguration

43. Finally, even if a brief physical interruption did occur at Layer-2, the Layer-4 session persists for the reasons set out in Section III(C) above. The "connection" is a logical session, not the instantaneous MAC-layer channel state. An interruption shorter than the TCP RTO is transparent to the session; and even longer interruptions are absorbed by the protocol's exponential backoff and by the generous application-layer timeouts that govern these systems. The Miracast (WFD) specification, for instance, defines a default RTSP "keep-alive" timeout on the order of 60 seconds. EX1050, Section 6.5.1. A Layer-4 session would be terminated only if the Layer-2 link failed to re-establish within these multi-second windows. Accordingly, the higher-level data connection required by the '088 patent is effectively "maintained" even when individual radio links are reconfigured.

IV. CONCLUSION

44. A disruption at Layer-2 does not, as a matter of principle or of practice, necessarily disrupt a Layer-4 session. Session continuity turns on two conditions — that the disruption stays within TCP's timing tolerance, and that Layer-3 addressing is preserved — both of which are satisfied by the coordinated channel-switch mechanisms (CSA/ECSA and TDLS) defined in the governing standards and by the IP/port-preserving architecture expressly disclosed in Iwami. Dr. Pachamanov's contrary conclusion follows only from the uncoordinated infrastructure-reassociation scenario of §10.3.5, which is neither the only available mechanism nor the one a POSITA would apply to the in-session band switch discussed in the Petition.

APPENDIX A

Summary

- Technology Executive with 30+ years of professional experience and an established track record of choosing, helping define and deploying winning technologies at an early stage.
- Successfully planned and deployed novel broadband access networks.
- Took the pioneering OLPC XO-1 laptop from concept to delivery, helping to solidify 1-to-1 computing in education and create the market for “netbooks.”
- Proven track record of team building in a variety of contexts, ranging from R&D labs, to product development and startup founding teams.
- Extensive Internet systems architecture, design and operation experience.
- Successful entrepreneur and accomplished public speaker engaged in a variety of civic-minded activities.

Experience

MIT Media Lab, Cambridge, MA

Director of Computing, Research Scientist

January 1996 – Present

Manages the group responsible for the design, installation, operation and maintenance of the laboratory's extensive networking and computing infrastructure, keeping the Media Lab at the forefront of technology developments by ensuring that the latest relevant technologies are deployed at the Media Lab in the most cost-effective manner.

Currently working on cost-efficient AI / Machine Learning infrastructure as well as on the societal implications of AI.

- Worked on methods and technology to provide broadband connectivity in underserved areas.
- Designed, procured and deployed the lab's HPC cluster, which is mainly used for AI/Machine Learning model development and training.
- Secured large compute and networking equipment donations for the lab.
- Worked with IS&T on a jointly managed network infrastructure.
- Rearchitected the lab's datacenters around virtualization and distributed Ethernet switching.
- Contributed to the design and implementation of “Glass Infrastructure”, a novel, interactive, personalized wayfinding system aiming to enhance collaboration between research groups and Media Lab sponsors.
- Implemented new state-of-art wireless infrastructure
- Moved the Lab's internal video production to High Definition implementing a fiber SDI video distribution network.
- Installed one of the first building-wide Wireless Local Area Networks using early pre-802.11 equipment and migrated the lab from anchored workstations to un-tethered laptops.
- Played an active hands-on and advisory role in 4 startups, all of which still exist today.

- Provided always-on and broadband connectivity for the homes of the lab's researchers before its commercial availability by designing and installing the necessary "access cloud" infrastructure. Moved the cloud's architecture from ISDN, to locally terminated DSL to outsourced frame-relay DSL to point-to-multipoint unlicensed spectrum TDD radios. The same infrastructure was used to connect the lab's remote sites resulting in great overall savings.
- Installed one of the first Wireless LAN Voice over IP systems and worked with Nortel on a large scale VoIP system for the lab's satellite offices.
- Conducted field research focusing on providing Internet connectivity to underserved areas using low-cost off-the-shelf equipment. Designed and installed a broadband access network covering the remote island of Patmos, Greece making it the first place in Greece with broadband connectivity available to consumers.
- Worked with lab sponsor Nortel on their Wireless Mesh product and performed alpha testing of the product on MIT's campus.
- Worked on the telecommunications of the LINCOS (little intelligent communities), which brought self-contained digital community centers (built inside old shipping containers) to remote communities in Costa Rica. Worked with Tachyon and its early 2-way satellite internet terminal.
- Established the lab's video webcasting service, making the Media Lab one of the first organizations to offer its sponsors access to events over the Internet.
- Taught an introductory freshman seminar on computer and network security, which was oversubscribed every year.

Hellenic Telecommunications Organization (OTE S.A.)

Member of the Board of Directors

June 2010 – September 2013

Hellenic Telecommunications Organization (OTE S.A.) is the largest telecommunications provider in Greece, and together with its subsidiaries forms one of the leading telecom groups in Southeastern Europe. OTE is among the five largest listed companies, with respect to capitalization, in the Athens Stock Exchange.

- Played a pivotal role in engineering a very successful senior management succession in 2010.
- During board tenure, OTE dramatically improved its financial health and overall performance and was able to successfully regain access to the international capital markets.
- OTE was a leader in Greece's recovery with an exceptional performance amidst the financial crisis.

One Laptop per Child, Cambridge, MA

Founding Member, Chief Connectivity Officer, VP Advanced Technology

February 2006 – January 2009 (on leave from MIT Media Lab)

Founding member of the core design and engineering team of OLPC's XO laptop. Began work on the laptop design while at the MIT Media Lab in 2005 and made defining contributions to its hardware and software architecture (embedded mesh, power management, motherboard architecture) and its industrial design (rabbit ears). The XO-1 laptop is being generally credited as the patriarch of the "Netbook" category that transformed the personal computing industry. Acted as a public face for the project, helping to successfully sell the concept to sponsors, partners, users and the general public. Minimized direct development costs through partner engagement and collaboration.

- Responsible for the laptop's wireless networking subsystem. Defined the unique high level architecture of the XO's embedded layer-2 mesh networking layer and co-designed its implementation, which Marvell carried out at no cost to OLPC. Defined the OS level interfaces as well as diagnostic hooks and tools. Oversaw the

implementation and its integration with the Linux kernel driver and performed a variety of validation and compatibility testing. Findings of that work were contributed and incorporated in the 802.11s draft standard.

- Designed and created prototypes of low cost connectivity peripherals (“active antenna” and “solar repeater”), currently the world’s smallest WiFi mesh nodes. Provided early stage NRE funds to startups that create connectivity equipment complementary to the XO (Meraki, Green-WiFi). Defined a low cost server architecture based on an ARM System on a Chip (SoC).
- Spearheaded the creation of the open 802.11s project which resulted in the first open source 802.11s-compliant mesh networking stack. The resulting code is already included in the current mainstream Linux kernel and commercial mesh networking products.
- Actively recruited and managed OLPC’s relationship with sponsors. Worked with the LATU team in Uruguay in devising a realistic plan to get all the XOs in Uruguay connected to the Internet via their school’s internet connectivity as well as on ways to get that school connectivity extended to the local community.
- Interfaced with telcos and equipment providers and arranged for pilot deployment connectivity.
- Enabled dual boot (Linux and Windows) capabilities on the laptop working with the Open Firmware developer to add PC BIOS support and interfaced with Microsoft at the technical level.
- Implemented OLPC’s network infrastructure.

Velti S.A., Athens, Greece

Co-founder

September 2000 – December 2006

Velti was a leading player in the mobile marketing space with multinational presence. It was the first Greek technology company to complete a successful IPO on London’s AIM stock exchange followed by a successful IPO on NASDAQ in 2011.

- Co-founded the company and participated in its business plan evolution.
- Recruited employees and investors for Velti.
- Worked on Velti’s Internet server infrastructure.

AWARE Inc., Bedford, MA

Systems Engineer

January 1993 – December 1995

- Worked on the development of the company’s ADSL technology and implemented an IP over ADSL testbed.
- Responsible for the design of parallel DSP algorithms and their implementation on INTEL distributed memory parallel supercomputers.
- Responsible for all aspects (design, purchasing, implementation, operation) of the company’s complex heterogeneous network.

ATKO Computer Systems S.A., Thessaloniki, Greece

Support Engineer / Developer

January 1987 – May 1990

- Responsible for the Northern Greece Region, won maintenance contracts with large clients.
- Systems integration, applications support, system utilities programming.
- Database Application Development.
- Hardware Installation, maintenance and repair.

Education

Aristotle University of Thessaloniki, Thessaloniki, Greece

Electrical Engineering Degree, October 1989.

Concentration on Computers and Electronics.

Boston University, Boston, MA

Master of Science in Computer Engineering, May 1991

Concentration on Parallel Computing

Selected Keynote Presentations

- A Brief History of Computational Thinking at the Media Lab, eTwinning Thematic Conference, Athens, September 2017
- Ubiquitous Connectivity for Ambient Intelligence, European Conference on Ambient Intelligence, Athens, November 2015
- Complexity and the Cloud: Where is my data?, ECIS.eu Symposium, Brussels, April 2013
- Developing, evolving and using a mesh network stack: the XO-files, IEEE MeshTech 2010, San Fransisco, November 2010
- A brief history of One-Laptop-Per-Child (OLPC) and what I learned from it , E-Learning 2009, Berlin, September 2009
- "Mesh(y) Communications" IEEE Consumer Communications and Networking Conference, Las Vegas, January 2008
- "OLPC Foundation", Defense Security Innovation, Quebec, Canada, November 2007
- "One Laptop per Child", Deloitte Executive Forum: Disruptions 2007, Athens Greece, November 2007
- "Technology as a driver for radical change in the world", Powerful Ideas Summit, Valencia. Spain, January 2007
- "Making the XO", IEEE Consumer Communications and Networking Conference, Las Vegas, January 2007
- "The \$100 laptop", Biel Bienne Communication Days, Biel, Switzerland, October 2006
- "Rethinking Connectivity", WorldComp'06, Las Vegas, June 2006

Selected Publications

- G. Kechriotis, M. Ann, M. Bletsas, R. Tolimieri and E.S. Manolakos, "A New Approach for Computing Multi-dimensional DFTs on Parallel Machines and its Implementation on the iPSC/860 Hypercube" *IEEE Transactions on Signal Processing*, vol. 43(1):272-285, January 1995
- M. An, N. Anupindi, M. Bletsas, G. Kechriotis, C. Lu, E.S. Manolakos, R. Tolimieri, "Comparison of two-dimensional FFT implementations on the Intel Paragon massively parallel supercomputer", in the Proceedings of the 1995 *IEEE Int. Conf. on Acoustics Speech and Signal Processing*, (ICASSP'95), Detroit, pp. 2755-2758, May 1995
- M. Bletsas, "Wirefree in Patmos", *BT Technology Journal*, Vol 22 No 4, October 2004.
- M. Minsky, *The Society of the Mind*, Preface for the 2nd greek edition, March 2006.
- R. Carrano, M. Bletsas, Michail and L. Magalhães, "Mesh networks for digital inclusion-testing OLPC's XO mesh implementation", in the Proceedings of the 2007 WSL, pp. 220-121
- M. Bletsas, *The MIT Media Lab's Glass Infrastructure: An Interactive Information System*, IEEE Pervasive Computing, April-June 2012

Selected Activities

- Honorary Doctorate recipient, Department of Cultural Technology, University of the Aegean
- Visiting Researcher, Center for Radical Transformation, Chiba Institute of Technology, Tokyo, Japan
- Lifetime Artist, San Francisco MOMA
- Member of the Board of Trustees, College Year in Athens
- Member of the Advisory Board for **enter•grow•go** , Eurobank's startup accelerator
- Ambassador for Vodafone's Greece Philanthropic Foundation
- Technology Plan advisory committee member, Wellesley public schools.
- Member of the Advisory Board and Juror, MIT Enterprise Forum Greece.
- Member of the oversight committee of the Hellenic Parliament's "Junior Parliament" effort.
- Member of Mayor Thomas Menino's (City of Boston) WiFi task force (2006). The purpose of the task force was to develop recommendations for Boston's future wireless network development efforts. (2006)
- Member of the external experts planning committee of the Greek Ministry of Development for EU's 4th Community Development Framework. (2006)
- Has testified as an expert witness in technology-related legal cases.
- Participated in the UN's World Summit for the Information Society (WSIS) in Geneva (2003) and Tunis (2005)
- Member of the first board of directors for the NGO "Access to Democracy" (2003)
- Founding Member and CTO of the Hellenic Resources Network, a pioneering web aggregator of news articles relating to the Balkan Peninsula. The leading Greek website for a number of years, which played an important role in diffusing the crisis between Greece and Turkey over the Imia Islets in the Eastern Aegean in 1996.
- Participated as a scuba diver and computer engineer in the underwater excavation of one of the oldest recorded shipwrecks (circa 3000BC), in the islet of Dokos in Greece during the summer of 1991 with the Institute of Underwater Archaeological Research, Greece