

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Palo Alto Networks, Inc.,
Fortinet, Inc. and
WatchGuard Technologies, Inc.
Petitioners,

v.

Selective Signals, LLC
Patent Owner.

U.S. Patent No. 8,111,629
Issue Date: Feb. 7, 2012
Title: Media Session Identification Method for IP Networks

Inter Partes Review No.: IPR2018-00594

PETITIONERS' REPLY TO PATENT OWNER'S RESPONSE

Mail Stop "PATENT BOARD"
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
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Petitioners' Exhibit List

<i>Exhibit #</i>	<i>Description</i>
1001	U.S. Patent No. 8,111,629 (“the ’629 Patent”)
1002	Select portions of prosecution history of the ’629 Patent (“File History”)
1003	Declaration of Petitioners’ Expert Dr. Samuel H. Russ (“Russ”)
1004	U.S. Pat. No. 8,085,775 (“Pappu”)
1005	U.S. Pat. No. 7,660,248 (“Duffield”)
1006	U.S. Pat. Publication No. 20060262789 (“Peleg”)
1007	U.S. Pat. Publication No. 20070076606 (“Olesinski”)
1008	“Toward the Accurate Identification of Network Applications” (“Moore”)
1009	“Automated Traffic Classification and Application Identification Using Machine Learning” (“Zander”)
1010	“Evaluating Machine Learning Methods for Online Game Traffic Identification” (“Williams”)
1011	Supplemental Declaration of Petitioner’s Expert Dr. Samuel H. Russ

I. Introduction

Nothing in Patent Owner's Response ("POR") refutes the grounds set forth in the Petition for why Claims 15 and 17-22 of the '629 Patent are unpatentable as obvious over the combination of Pappu and Peleg. The POR is largely a cut-and-paste of Patent Owner's previous arguments that the Board already considered – and rejected – in its decision to institute trial. Moreover, the POR fails to address the reasons for institution provided in the Board's Institution Decision ("ID"). Thus, the POR does not provide the Board with any arguments that warrant reconsideration of the Board's previous analysis.

The POR focuses on three terms recited in Claim 15 as not being taught by Pappu or Peleg: "traffic packet characteristics," "session characteristics," and "session" related terms generally. As to "traffic packet characteristics," Patent Owner repeats verbatim its argument that the term "traffic packet characteristics" includes "more than header information" in order to argue that Pappu does not disclose the three limitations of Claim 15 reciting that term. POR 11, Patent Owner Preliminary Response ("POPR") 7-8. But the Board already rejected this claim construction argument, in part because the Specification of the '629 Patent expressly defines traffic packet characteristics to include packet header information. ID 9. Patent Owner offers the Board nothing new to justify revisiting

the Board's rejection of Patent Owner's repeated argument. Moreover, the prior art asserted in the Petition discloses traffic packet characteristics, even if it is improperly construed.

Patent Owner's arguments concerning "session characteristics" and "session" related terms are once again based on the flawed premise that the term "session" as used in the '629 Patent is different than the "flow" described in the Pappu reference and is also different than the "session" described in the Peleg reference. POR 21, 25; POPR 16-18, 20. Patent Owner still does not propose a claim construction for "session," instead continuing to rely on the unsupported declaration of its expert to argue that a "session" includes certain attributes that allegedly are not disclosed in the cited references. POR 25; POPR 3,18. However, these "attributes" of a session are not supported by the intrinsic evidence of the '629 Patent. ID 9. Patent Owner also repeats its mischaracterization for Pappu and Peleg, POR 31; POPR 13, 20, which is similarly flawed. ID 18. As to Pappu, Patent Owner cites to the deposition testimony of Petitioner's expert, but the testimony only reinforces that Pappu's "flow" is not different than "session" as used in the '629 Patent. POR 10. Moreover, Patent Owner fails to address Peleg's teaching of "session," as discussed by the Board's Institution Decision. ID 15-16. This Reply, in any event, reinforces why there is no meaningful difference between

the term “sessions” as used in the ’629 Patent, and the disclosures of “sessions” in the Peleg reference and “flows” in the Pappu reference.

Patent Owner also repeats verbatim its arguments that dependent Claims 17, 18, and 20-22 are not obvious over Pappu in view of Peleg, and that the combination of Pappu and Peleg is improper. POR 27-28; POPR 25, 27 These, too, were already rejected by the Board. ID 15-20.

In this Reply, Petitioners also address the Board’s finding that Petitioners have not established a reasonable likelihood that Claim 19 is unpatentable. Petitioners respectfully submit that Pappu and Peleg disclose the limitations of Claim 19.

Petitioners accordingly request that the Board issue a final written decision holding that Claims 15 and 17-22 are unpatentable as obvious over the combination of Pappu and Peleg.

II. The Board Should Reject Patent Owner’s Construction of the Term “Traffic Packet Characteristics”

The POR repeats its argument that the term “traffic packet characteristics” should be construed as “parameters associated with a traffic packet, the parameters including more than packet header information and excluding packet payload content whose inspection is common in deep packet inspection techniques.” POR 12-13; POPR 11. The Board already rejected this claim construction argument,

including because the intrinsic record expressly contradicts Patent Owner's narrowing construction. ID 9.

Traffic characteristics are described by the '629 Patent as including packet header information:

Traffic characteristics relate to those parameters inherent to packets traffic flow as it travels from source to destination and includes features such as packet length, inter-arrival period, bandwidth and statistical and other derivations thereof **as well as certain header characteristics such as source address and destination address.**

PAN-1001 6:11-22 (emphasis added).

The POR repeats that the "'629 Patent explicitly discounts the use of (and therefore teaches away from) relying only on packet header information in analyzing IP traffic." POR 11; POPR 7. The POR also repeats that the '629 Patent teaches the use of "more than packet header information," such as packet length and inter-arrival period, which are "not found in the packet header." POR 12; POPR 7. The Board previously rejected these arguments for several reasons:

- First, the Board found that the '629 Patent did not disparage using only header information; instead, the Board found that the '629 Patent disparaged using only the destination address. ID 8.

- Second, the Board found that “packet length” is found in the header information, citing to the admission of Patent Owner’s expert (Dr. Nakibly) that the packet length in the header “refers to the length of the IP header and its payload.” ID 8-9. As a result, the Board found that the embodiments in the ’629 Patent that describe the use of packet length do not require more than packet header information, as asserted by Patent Owner. ID 9.
- Third, the Board found that the Specification contradicts Patent Owner’s claim construction, as the Specification states that “traffic characteristics include certain header characteristics such as source address and destination address.” ID 9 (citing to *PAN-1001* 6:11-17).

Patent Owner failed to even *attempt* to respond to the Board’s reasons for rejecting Patent Owner’s claim construction (ID 6-9), all the while repeating the same arguments from its POPR *verbatim*. POR 11-16, POPR 6-11. Thus, the POR does not raise any issue that should cause the Board to revisit whether to adopt Patent Owner’s proposed claim construction. Patent Owner’s veiled attempt to avoid the cited prior art through a repeated claim construction argument that is squarely contradicted by the intrinsic record accordingly fails.

III. Pappu, Alone or in Combination with Peleg, Discloses “Traffic Packet Characteristics” Even Under Patent Owner’s Proposed Incorrect Construction

Patent Owner still argues that Pappu does not disclose three limitations of Claim 15 that recite “traffic packet characteristics.” POR 16-20; POPR 32-34.

Patent Owner’s argument is premised on the Board adopting its proposed construction of “traffic packet characteristics,” which includes “more than header information.” POR 17. Patent Owner does not contest that these limitations are disclosed by Pappu if the Board rejects Patent Owner’s proposed construction (as the Board has already done, ID 11-16. POR 16-20.

Moreover, Pappu discloses the “traffic packet characteristics” limitations even under Patent Owner’s previously rejected proposed construction. The POR attempts to limit the disclosure of Pappu to a single embodiment, *e.g.*, Pappu “teaches management of ‘flows’- sets of packets grouped solely on the basis of packet header information.” POR 2. However, a flow is defined in Pappu to be “a set of packets that are *related in some manner*.” *PAN-1004* 6:16-17 (emphasis added). Furthermore, Pappu teaches that flows can be identified and classified based on observed behavioral characteristics, not just based on packet header information:

In one embodiment of the invention, flows are identified and classified based upon their observed behavior.

Because flows are identified and classified based upon

their observed behavior, and because their behavior cannot be hidden, the traffic type that a flow represents can be estimated with relatively high accuracy even if the contents of the packets that represent the traffic type are dissimilar.

PAN-1004 2:41-47: *PAN-1011* ¶5

Further still, Claim 1 of Pappu discloses an embodiment where the flow is not identified by header information alone:

1. A machine-implemented method for the identification and handling of a single application flow, the flow comprising a plurality of information packets, and the method comprising:
creating a flow block as the first packet of a flow is processed by a router;
said flow block being adapted to store payload-content agnostic behavioral statistics about said flow;
updating said flow block with the flow's payload-content agnostic behavioral statistics as packets belonging to said flow are processed by said router;
said flow being incapable of being identified by header information alone;

...

PAN-1004 Claim 1 (emphasis added); *PAN-1011* ¶6

Pappu also teaches that the described method does not need to rely only on information contained in the packets:

Routers which employ the techniques described herein may classify and handle packets in a manner that takes into account information beyond that which is contained in the packets themselves (some kinds of traffic cannot be identified only on the basis of the information contained in the packets that form that traffic).

PAN-1004 8:33-38; *PAN-1011* ¶7

Pappu teaches that information that is not contained in the packets includes the observed statistics identified in FIG. 4. Thus, a POSA understood that the same statistics that could be used to identify the type of traffic could also be used to group the packets. For example, Pappu discloses that “by grouping packets into flows, it is possible to aggregate individual packets in a meaningful way to allow the traffic flowing through router 102 to be understood at a higher level.” *PAN 1004* 6:29-32; *PAN-1003* ¶75

A POSA understood Pappu to group packets into flows and to use the observed behavioral statistics disclosed by Pappu to group the packets in a meaningful way. For example, the flow rate statistics shown in Fig. 4 of Pappu describe the data rate of the flow. Data rate is a direct way of grouping packets in a meaningful way – for example, a POSA understood that a flow with a data rate on the order of 50 kbit/s is much more likely to be a VOIP session than a flow with a data rate on the order of 1 Mbit/s. Thus, the teachings of Pappu provide examples

of non-header parameters that are relatively easily gathered and that help inform the system as to grouping and classification. *PAN-1011* ¶8

In the alternative, Peleg also discloses grouping packets on information other than header information. As described in the State of the Art section of the Petition at pages 25-26, at the time of the invention of the '629 Patent, a POSA understood that it was known to gather statistical information from each packet using “flow level” analysis and inferring the type of application from the traffic statistics. *PAN-1005* 1:7-14, 6:28-47; *PAN-1003* ¶60. Flow level statistics include packet length, 5-tuple information, and inter-arrival times between packets. *PAN-1005* 6:48-54; 7:16-20; *PAN-1003* ¶60. This technique required data collected at a packet level, but then grouped packets into flows. The relative variance of these inter-arrival times was used as a measure of the burstiness (i.e., the number of high-bandwidth transmission over a short period of time) of a traffic stream. Intraflow/connection features include loss rates, latencies, etc. *PAN-1005* 7:20-24; *PAN-1003* ¶60.

Peleg is one such prior art method that used flow analysis to group packets. Like the '629 Patent, Peleg calls packets grouped by common characteristics:

The classifier has to decide when there is a session according to several consecutive packets that matches its rules. The classifier may identify that is it not the same session according a few consecutive packets and their

time, i.e., the classifier has to be able to know when there is a streaming session and when the streaming session ends.

PAN-1006 [0047]; *PAN-1003* ¶102

Peleg describes the use of several characteristics other than header information, including time interval between packets and throughput per second. *PAN-1006* Claim 3. In one embodiment, Peleg describes grouping packets into the same session based on inter-arrival time: “In accordance with the present invention, an exemplary classifier classifies the packets based on their length and/or the time intervals between successive packets belonging to the same session.” *PAN-1006* [0022]. A POSA would be motivated to combine the teaching of Peleg (*PAN-1006* [0008]) (“To one of ordinary skill in the art, there is thus a need, and it would be highly desirable to have a method and corresponding device for classifying sessions based on the pattern and/or characteristics of traffic rather than traffic contents) with the teachings of Pappu (*PAN 1004* 6:29-32) (“by grouping packets into flows, it is possible to aggregate individual packets in a meaningful way to allow the traffic flowing through router 102 to be understood at a higher level”) to use a traffic characteristic other than header information, *e.g.*, inter-arrival time, to group packets into common sessions. Such a combination would be useful in an embodiment disclosed in Pappu of a flow that is “incapable

of being identified by header information alone.” *PAN-1004* Claim 1; *PAN-1011*

¶9

Therefore, even under Patent Owner’s proposed claim construction, Pappu, alone or in combination with Peleg discloses traffic packet characteristics.

IV. Claim 15 is Unpatentable Because There is No Substantive Difference between “Session” and “Flow”

Patent Owner asserts that Pappu does not disclose the limitation of “analyzing said grouped packets of said presumed session for session characteristic” recited in Claim 15. POR 7. Although Patent Owner still does not provide a proposed construction for “session,” Patent Owner repeats its attempt to distinguish over the asserted prior references by arguing that “[a] session is a set of packets that relates to an application-level (i.e., layer-7), bidirectional communication. *Id.* at ¶ 87,” (POR 6; POPR 5), and that “[a] session is made up of multiple flows.” POR 2; POPR 2. Moreover, Patent Owner still fails to address Peleg’s teaching of “session,” as discussed by the Board’s Institution Decision. ID 15-16. Unsurprisingly, Patent Owner’s arguments still fail.

A. The Patent Owner Still Cannot Maintain Its Asserted Distinction Between Sessions and Flows

Once again, the Patent Owner provides no support (intrinsic or otherwise) for asserting that a session must be bidirectional and is made up of packets that belong to multiple flows. POR 21-22; POPR 16-17. Indeed, Patent Owner made

no attempt to address the reasons the Board rejected Patent Owner’s “session” arguments.

Instead, Patent Owner repeats its arguments by citing to and relying on conclusory statements from the same declaration of its expert (Dr. Nakibly) that was previously filed with its POPR. POR 21-22; POPR 16-17 (both citing Ex. 2001 ¶¶ 85-92). Dr. Nakibly’s declaration includes his opinion regarding various “attributes” of a “session,” but fails to disclose any intrinsic evidence or factual support for his opinion. Ex. 2001 ¶¶ 85-92. Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight. 37 C.F.R. § 42.65(a). Thus, the declaration of Dr. Nakibly is entitled to little, if any, weight.

B. Patent Owner’s Imposed Requirements for “Session” Are Made-up and Should Be Rejected

The intrinsic record makes clear that Patent Owner’s repeated effort to build these two requirements (bi-directionality and inclusion of multiple flows) into the term “session” should still be rejected.

First, the claims do not impose these two requirements.

Second, the Specification teaches:

a media session identification method that identifies media sessions from the flow of packets and assigns specific packets to the media sessions.

PAN-1001 1:18-21.

This does not indicate that a session is “made up of multiple flows,” POR 2, but rather suggests that multiple media sessions can be identified *from* the flow of packets, where the ’629 Patent uses the term “flow of packets” generically to mean IP based media traffic over networks. Id. 1:16-28; *PAN-1011* ¶10

Third, the Specification does not require that a session be bi-directional, as the Specification expressly includes “video streams” as a “session,” which are well-known to be unidirectional:

It is noted that the term “session” includes streaming of data, such as in for example a video stream.

PAN-1001 1:20-23; *PAN-1011* ¶11

In fact, each of the ’629 Patent, Pappu, and Peleg, provide VOIP and video streaming over IP as an example of a session or flow, thus confirming they are all referring to the same concept. *PAN-1001* 1:20-23; *PAN-1004* Abstract, 6:34-37; *PAN-1005* ¶[0020]; *PAN-1011* ¶12

Nonetheless, Patent Owner argues that the same applications (*i.e.*, VOIP and video streaming) are necessarily bi-directional when disclosed as examples in the ’629 Patent but are unidirectional for the purposes of Pappu and Peleg. POR 8, 34; POPR 22, 24. As these are the same example, and Patent Owner’s flawed attempt to avoid the prior art must fail. POR 6. Likewise, the mere fact that Patent Owner’s expert was willing to repeat this argument does not make it more plausible. POR 6; POPR 5.

For the reasons discussed next, a POSA would have understood that there is no substantive difference between the “session” described in the ’629 Patent, the “flow” described in Pappu, and the “session” described in Peleg. *PAN-1003* ¶¶99, 102, 103.

1. Pappu’s “Flow” Is The Same As The ’629 Patent’s “Session”

Patent Owner argues that Pappu’s “flow” is different than the ’629 Patent’s “session.” POR 7

However, in the ’629 Patent, a “session” is a set of packets that are grouped into a common session type:

Packet identification or grouping, are terms used to refer to an identification of packets that belong together to a session type in a common session.

PAN-1001 3:40-42; *PAN-1011* ¶13

The ’629 Patent describes that the common session type can be VOIP or video over IP. *Id.* 1:46-55; *PAN-1003* ¶49

Pappu similarly describes that “a flow is a set of packets that are related in some manner” (*PAN-1004* 6:16-17) and can be grouped according to traffic type such as VOIP. *PAN-1004* 6:33-42. Pappu teaches that using observed behavior allows the traffic type of the flow to be determined with high accuracy: “Because flows are identified and classified based upon their observed behavior, and because their behavior cannot be hidden, the traffic type that a flow represents can be

estimated with relatively high accuracy even if the contents of the packets that represent the traffic type are dissimilar.” *PAN-1004* 2:23-53; *PAN-1011* ¶14

A POSA would have understood that “flows” described in Pappu correspond to the “sessions” described in the ’629 Patent, with both their goals being to group packets into common traffic types in order to make best use of resources to control the packets. *Compare* Pappu *PAN-1004* 6:38-42 (“To make the best use of available resources, and to best control the traffic that passes through router 102, router 102 would benefit from an ability to identify different types of traffic, and to take specified appropriate actions relative to those types of traffic.”) *with* the ’629 Patent *PAN-1001* 6:19-22 (“The traffic characteristics may also be used to identify the session type so that appropriate resources can be made available or not for the session, or other provisioning and control actions may be applied to the session.”). *PAN-1011* ¶15

Thus, Patent Owner is incorrect that a “flow” as used in Pappu is different than a “session” as used in the ’629 Patent. Both a session and a flow include packets grouped together according to the type of packet traffic, and Patent Owner’s argument that the ’629 Patent is directed to “managing sessions” while Pappu is directed to “managing flows” is nothing more than attorney argument to evade the prior art. POR 5-7.

2. Peleg’s “Session” Is The Same As The ’629 Patent’s “Session”

Although Patent Owner acknowledges that Peleg uses the term “sessions”, Patent Owner repeats its failed argument that Peleg is really describing “flows” because Peleg’s “session” is “unidirectional. POR 31-32. As the Board recognized, the “session” taught in Peleg is not different from the “session” described in the ’629 Patent and recited in the claims. ID 16. Peleg describes that a classifier determines whether there is a “session” when several consecutive packets matches it rules. *PAN-1006* [0047]. Peleg describes that “[i]n an embodiment of the invention, the session are VoIP sessions, and/or Multimedia over IP sessions.” Ex. 1006 ¶ 20. As the Board concluded, this usage of “session” is consistent with the usage of “session” in the ’629 patent. ID 16.

C. There is No Substantive Difference between Pappu’s “Behavioral Characteristics” and the Claimed “Session Characteristics”

Patent Owner further repeats its argument that the “behavioral characteristics” described in Pappu (used interchangeably with “behavioral statistics”) are not the claimed “session characteristics” because in Pappu, “every packet is treated the same.” POR 8-11; POPR 21-22. Once again, the only basis for these statements is Patent Owner’s expert’s unsupported assertions.

1. Pappu and the ’629 Patent Address Same Goal as to Session Characteristics

The ’629 Patent describes grouping packets into sessions having a common traffic type, and then applies a policy for that specific type of traffic to all the

packets that have the same traffic type, and like Pappu, identifies VOIP traffic as an example:

It is desirable to identify packets as belonging to a session to group the succession of IP packets and also to identify a particular application or type that the session belongs to in order to apply provisioning, quality of service and control actions to the session or stream; applications that are real time sensitive such as Voice-over-IP and/or Video-over-IP tend also to be bandwidth availability sensitive, therefore maintaining the quality of service for such application sessions require the identification, and possibly the classification, of their traffic streams.

PAN-1001 1:46-55; *PAN-1003* ¶49

Similarly, Pappu groups packets into flows having a common traffic type, and then applies a policy for that specific type of traffic to all the packets that have the same traffic type. *PAN-1004* 3:4-21. Rather than treating all packets the same, Pappu expressly describes that packets grouped together as a VOIP traffic would be treated differently than packets grouped together as P2P traffic or online gaming traffic:

For example, multiple flows that exhibit behaviors that are characteristic of P2P traffic all may be handled in one way that is appropriate for P2P traffic. Multiple flows that exhibit characteristics of VOIP traffic all may be

handled in another way that is appropriate for VOIP traffic. Multiple flows that exhibit characteristics of online gaming traffic all may be handled in yet another way that is appropriate for online gaming traffic.

PAN-1004 3:23-30; *PAN-1011* ¶16

Patent Owner cites to the deposition testimony of Petitioners' expert, but the quoted testimony only confirms that Pappu groups packets into flows having a common traffic type, and then applies a policy for that specific type of traffic to all the packets that have the same traffic type. POR 9-10.

The '629 Patent and Pappu thus describe treating sessions and flows in an identical manner, and neither teaches that all packets are treated the same way, as that would defeat the stated goal of both the '629 Patent and Pappu discussed above. *PAN-1011* ¶17

2. Patent Owner's Assertion that Pappu's "Behavioral Characteristics" and the '629 Patent's "Session Characteristics" Are Different Is Unsupported

Patent Owner further repeats its argument that Pappu's "behavioral characteristics" are not the claimed "session characteristics" because Pappu's behavioral characteristics are aggregate packet data instead of packet specific data. POR 8-11; POPR 22. This assertion is inaccurate for two reasons (as further detailed in the Petition at 15 & 52-53 but not explicitly addressed in the ID).

First, the '629 Patent describes that session characteristics **expressly** include aggregated packet data such as average inter-arrival period and average length:

Specifically, as explained in connection with FIG. 2., which illustrates “a more detailed embodiment of the apparatus of FIG. 1, “[p]acket length, inter-arrival period (‘dt’) and their derivatives may be accumulated” and used to derive “statistical parameters such as [a]verage [inter-arrival period], [a]verage length” and their variances and covariances.

PAN-1001 8:28-30, 8:58-63; *PAN-1003* ¶46

These derivatives can then be used to determine and categorize sessions.

PAN-1001 8:66-9:2; *PAN-1003* ¶46

Second, Pappu describes that the behavioral characteristics are not limited to “aggregate packet data”, but rather also **expressly** include “packet specific information” such as packet size and inter-arrival gap between two packets:

an instantaneous flow rate (derived by dividing (a) the *size of the most recently arrived packet* of the flow by (b) the *inter-arrival time gap* between the two most recently arrived packets of that flow).

PAN-1004 7:42-46 (emphasis added); *PAN-1003* ¶106; *PAN-1011* ¶18

Accordingly, Patent Owner’s repeated argument that Pappu’s “behavioral characteristics” and the '629 Patent’s “session characteristics” lacks support and

should be rejected. Thus, not only is Patent Owner's assertion that Pappu's disclosure of "flows" is not the same as "sessions" not supported, that assertion is also contradicted by the express disclosures of the '629 Patent and Pappu.

V. Dependent Claims 17 and 20-22 are Unpatentable Over Pappu, Alone or in Combination with Peleg

As in the POPR, the POR does not argue for the patentability of dependent Claims 17 and 20-22 separately from the patentability of Claim 15. POR 28; POPR 27. Therefore, if Claim 15 is invalid, so are Claims 17 and 20-22.

VI. Pappu, Alone or in Combination with Peleg, Teaches the "Threshold" Limitation of Claim 18

The POR repeats *verbatim* its argument that Pappu does not teach the "threshold" limitation of Claim 18 because Pappu teaches a "binary choice of 'everything either matches or it doesn't'" and argues that a binary choice "does not constitute a 'threshold.'" POR 27-28; POPR 25-26. In the Institution Decision, the Board already rejected this argument finding that:

Pappu teaches a threshold because it teaches that packets are grouped into a flow "if those packets share a *sufficient* amount of header information." Ex. 1004, 6:15-19 (emphasis added). The word "sufficient" indicates a threshold, above which the packets are grouped into a flow.

ID 16-17. The POR does not even attempt to address the Board's finding that Pappu discloses the "threshold" limitation.

VII. The Combination of Pappu and Peleg is Proper

Here, too, the POR repeats Patent Owner’s argument that the combination of Pappu and Peleg is improper because: (1) Peleg teaches away from Pappu, (2) Pappu and Peleg address different problems and (3) there is no motivation to combine the two. POR 28-31; POPR 27-30. The Board already considered and rejected these arguments. ID 17-19.

A. Peleg Does Not Teach Away From Pappu

The POR repeats its failed argument that Peleg teaches away from Pappu because Peleg “disparages reliance on header-only information.” POR 29; POPR 28. However, as noted by the Board, Peleg disparages reliance only on “port” identification and does not disparage reliance on header-only information. ID 18.

Moreover, Pappu and Peleg disclose parallel teachings. For example, Pappu discloses payload inspections as “expensive” (*PAN-1004* 1:40-43) and “current P2P protocols have rendered port-based identification techniques ineffective” (*id.* 2:7-9); and Peleg discloses “[a] significant and general limitation of currently available classifiers, is that they are based on content analysis” (*PAN-1006* [0004]) and “an additional significant limitation of prior art devices operating on the basis of ports identification, is that port identification is not a robust mechanism” (*id.* at [0005]).

In other words, there is no factual basis for Patent Owner’s argument that Peleg teaches away from Pappu. This argument was already rejected by the Board. ID 18. Rather, Peleg and Pappu both teach away from sole reliance on ports and discuss the costs of full payload inspections.

B. Pappu, Peleg, and the ’629 Patent Address Similar Problems

Patent Owner also argues, as repeated from POPR (pp. 28-29), that Peleg and Pappu address different problems than the ’629 Patent. But the Board rejected this argument, too. ID 18. This argument rests on Patent Owner’s assertion that both Peleg and Pappu “address the same problem: *flow* classification” and “[n]either addresses sessions.” POR 29. As discussed previously, Patent Owner’s assertion that a flow is not the same as a session is misplaced and without support. Moreover, the problem common to the ’629 Patent, Pappu, and Peleg is that of identifying related packets without full payload inspection. *See, e.g., PAN-1001* 2:12-58 (problems with deep packet inspection); *PAN-1004* 1:40-43 (problems with payload inspection); *PAN-1006* [0007] (“rather than traffic contents”).

C. The Motivation to Combine Pappu and Peleg is Proper

Patent Owner’s third argument that the Petition fails to provide a proper motivation to combine Pappu and Peleg is also repeated from POPR (pp. 29-30) and was already rejected by the Board. ID 19. The argument is based on Patent Owner’s assertion that it is improper for the Petition to state alternative theories for

how the cited art discloses a limitation. There is nothing improper about arguing alternative grounds, and Patent Owner cites no authority suggesting otherwise. The Petition (at 43) states that Pappu groups packets into a “presumed session.” The Petition then states, “To the extent that Patent Owner asserts that Pappu does not disclose grouping packets in a presumed session, it would have been obvious in view of Peleg.” Pet. 43. The Petition then includes a description of Peleg and identifies the specific motivation to combine on pages 44-45. Thus, if the Board determines that Pappu’s “flow” is different than the recited “session,” Petitioners rely on Peleg’s teachings of grouping into a “session.”

VIII. The Petition Established that Claim 19 is Obvious Over Pappu in Combination with Peleg

As an initial matter, the Scheduling Order entered in this case stated “[t]he patent owner is cautioned that any arguments for patentability not raised and fully briefed in the response will be deemed waived.” Scheduling Order 8/29/18, Paper 4. Because the POR does not include any arguments for the patentability of Claim 19, the Patent Owner has waived its ability to argue for the patentability of Claim 19.

In the Institution Decision, the Board held that the Petitioners did not establish a reasonable likelihood that it would prevail in showing that Claim 19 is unpatentable. ID 19. Specifically, the Board held that Pappu teaches “average” packet length and “average” inter-arrival period, which are different from Claim

19's recited "packet length" and "inter-arrival period." ID 17. Further, the Board held that "we interpret 'said characteristics' recited in claim 19 as referring to the 'traffic packet characteristics' recited in claim 15" and thus held that Petitioners' reliance on average inter-arrival period in Claim 19 is "inconsistent with its earlier reliance on Pappu's five-tuple" as a traffic packet characteristic in Claim 15. ID 17.

It appears that the Board overlooked that Pappu does teach inter-arrival period, not just "average" inter-arrival period. Pappu uses the term "inter-packet gap" and describes that the inter-packet gap can be used to derive an "average" inter-packet gap (*PAN-1004* 7:34-42) and that "the inter-packet time gap between the two most recently arrived packets" can be used to derive an instantaneous flow rate. *PAN-1004* 14:57-15.4.

The Petition also identified that the "session characteristic" recited in Claim 15 corresponded to the behavioral characteristics of the flow, including the individual packet characteristic of an inter-packet gap. Petition 47.

Moreover, the Petition shows that the "inter-packet gap" disclosed by Pappu corresponds to the limitation recited in Claim 19 "wherein said characteristics comprise at least one member of the group consisting of packet length, inter-arrival period, and average bandwidth." Petition pp. 52-53.

The Board's statement that it interprets "said characteristics" recited in claim 19 as referring to the 'traffic packet characteristics' recited in claim 15" overlooks that Claim 15 recites **both** "traffic packet characteristics" and "session characteristics." Therefore, either of "traffic packet characteristics" or "session characteristics" provides antecedent support for "said characteristics" in Claim 19. There is no support to limit Claim 19's "said characteristics" to **only** "traffic packet characteristics." This is particularly true where the '629 Patent makes clear that an inter-arrival period can be a "traffic packet characteristic" and can also be a "session characteristic" when used to identify the session type:

The session analyzer may use the packet's traffic characteristics, such as packet length and/or inter-arrival period to indicate the session type.

PAN-1001 7:26-28.

The traffic characteristics may also be used to identify the session type so that appropriate resources can be made available or not for the session, or other provisioning and control actions may be applied to the session.

PAN-1001 6:19-22.

The session characteristics allow a session type to be identified and then in stage 66, resources can be assigned accordingly.

PAN-1001 10:62-64.

The '629 Patent claims “inter-arrival period” as a session characteristic:

10. The apparatus of claim 8, wherein said session analyzer is configured to use at least one member of the group consisting of: ... inter-arrival period...

PAN-1001 12:44-48.

Thus, the recitation of “said characteristics” in Claim 19 can refer to either “session characteristics” or “traffic packet characteristics” recited in Claim 15.

The Petition’s identification of the inter-packet gap as corresponding to the “said characteristic” in Claim 19 is consistent with the Petition’s identification of the inter-packet gap as corresponding to the “session characteristic” in Claim 15.

Therefore, as set forth in the Petition, because Pappu discloses inter-arrival time gap (*inter-arrival period*), the Petition establishes that Pappu discloses the limitations of Claim 19. Petition 46, 52-53.

IX. Conclusion

For the reasons set forth above, Petitioners request that the Board issue a final written decision finding all Challenged Claims unpatentable over the grounds identified in the Petition.

Respectfully submitted,

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Dated: February 21, 2019

CERTIFICATION OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e), 42.8(b)(4) and 42.105, the undersigned certifies that on the 21 February 2019, a complete and entire copy of Petitioners' Reply to Patent Owner's Response and all supporting exhibits were served electronically through the PTAB's E2E system on Patent Owner's counsel at:

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24 *et seq.*, the undersigned certifies that this document complies with the type-volume limitations. This document contains 5,504 words as calculated by the "Word Count" feature of Microsoft Word 2010, the word processing program used to create it.

Dated: Feb 21, 2019

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