

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' OPPOSITION TO PATENT OWNER'S CONTINGENT
MOTION TO AMEND**

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PETITIONERS' BRIEF EXHIBIT LIST

Exhibit Number	Document
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”)
1011	Supplemental Declaration of Petitioner’s Expert Dr. Samuel Russ

I. INTRODUCTION

Patent Owner filed a contingent Motion to Amend (“Motion”) to substitute new independent Claim 25 for dependent Claim 17. Substitute Claim 25 adds the following limitations to Claim 17 (shown as underlined):

wherein the traffic packet characteristics comprise parameters
associated with a traffic packet, the parameters including more
than packet header information, and

wherein said identifying a session type is followed by at least one of
the group comprising: providing provisioning and providing
control actions to the presumed session.

Patent Owner also offers substitute Claims 26-29, but these claims merely change the dependency of Claims 17-18 and 20-22 to depend from Substitute Claim 25, respectively, and do not add further substantive limitations to the substitute claims (collectively, Claims 25-29 are the “Substitute Claims.”)

The Substitute Claims seek to redefine the definition of “traffic packet characteristics” to include packet header information in addition to requiring that they include a class of parameters having well-known purposes that are not packet header information. But the Board already rejected Patent Owner’s related claim construction argument. Institution Decision (“ID”) 6-9 &15.

Patent Owner has not shown that the original disclosure of the ’629 Patent supports the Substitute Claims. Moreover, the proposed amendments fail to

particularly point out and distinctly define the metes and bounds of the Substitute Claims.

In any event, the art of record already discloses the routine use of non-header parameters in identifying and classifying flows/sessions as claimed. For example, Pappu and Peleg discuss the routine use of inter-arrival period – which is not included in packet headers – to classify and identify flows. In addition, traffic packet characteristics that include parameters having “more than packet header information” were *also* disclosed by newly cited art “Duffield.”

II. SUMMARY OF THE UNPATENTABILITY GROUNDS

The Board instituted the present trial on the grounds that Petitioners have established that there is a reasonable likelihood that Claims 15, 17, 18, and 20-22 are unpatentable under 35 U.S.C. § 103 as obvious over Pappu alone, or in combination with Peleg. In the Patent Owner Response (“POR”), the Patent Owner asserted that neither Pappu nor Peleg disclose traffic packet characteristics, which it argued means “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. Likewise, in the Motion, Patent Owner makes arguments that overlap with its arguments in the POR regarding Pappu and Peleg with respect to Substitute Claim 25, arguing that “both *Pappu* and *Peleg* describe using ***header-only data*** for

traffic management. Neither *Pappu* nor *Peleg* disclose *wherein the traffic packet characteristics comprise parameters associated with a traffic packet, the parameters including more than packet header information.*” Motion 6 (emphasis in original). Again, the Board already rejected Patent Owner’s claim construction argument. ID 6-9 &15.

Substitute Claims 25-29 are obvious (1) over Pappu, alone, or in combination with Peleg as set forth in the Petition, and (2) over Pappu, alone, or in combination with Peleg, or in combination with Duffield as set forth below. Because the Motion is contingent upon the Board finding that Claims 15 and/or 17, 18, 20-22 are unpatentable, this Opposition is directed to how the additional limitations are also found in the cited art.

III. THE SUBSTITUTE CLAIMS ARE NOT SUPPORTED BY THE ORIGINAL DISCLOSURE AND INDEFINITE UNDER 35 U.S.C. § 112

A. The Substitute Claims Are Not Supported By The Original Disclosure

In the Institution Decision, the Board rejected Patent Owner’s attempt to construe the term “traffic packet characteristics” to require “more than packet header information” and, after considering the intrinsic and extrinsic evidence, held “we construe ‘traffic packet characteristics’ to encompass characteristics derived exclusively from header information.” ID 9. Patent Owner’s attempt to redefine the term “traffic packet characteristics” in the Motion should likewise fail

because there is similarly no support in the original disclosure of the ‘629 Patent to require “traffic packet characteristics” to include something “more than packet header information.”¹

Substitute Claim 25 includes three recitations of “traffic packet characteristics” influenced by the proposed amendment:

1. The “obtaining” limitation – “obtaining *traffic packet characteristics* of said passing packets of respectively unknown session types;”
2. The “comparing” limitation – “comparing said obtained packets with each other using *respectively obtained traffic packet characteristics*;”
3. The “grouping” limitation – “grouping together those packets having similar values of *said traffic packet characteristics* into a presumed session.”

¹ The Patent Owner’s amendment also adds the language “comprise parameters associated with a traffic packet.” The Specification uses the term “parameters” interchangeably with “characteristics” and thus the Opposition’s description of how the cited art discloses the traffic packet characteristics also satisfies the claimed “parameters associated with a traffic packet” limitation. *See PAN-1001* 6:11-19; 7:23-25, 47-49, 57-60.

The wherein clause added by Patent Owner attempts to redefine the recited “traffic packet characteristics” to include packet header information and something “more than packet header information.”

Under 35 U.S.C. § 316(d)(3), an amendment in an *inter partes* review cannot introduce new matter. New matter is defined as an addition to the disclosure without support in the original disclosure. Normally, a claim element without support in the original disclosure (i.e., the application as originally filed) merits a rejection under 35 U.S.C. § 112 for lack of written description support. *Veam Software Cor. v. Veritas Tech., LLC*, IPR2014-00090 (PTAB Jul. 17, 2017)(Paper 10). Under 37 C.F.R. §42.121, a motion to amend must set forth the support in the original disclosure of the patent for each claim that is amended. The Motion identifies specific cites to U.S. Pat App. No. 12/513,510 (the “’510 Application”) that purports to support Patent Owner’s new definition of traffic packet characteristics. Motion 5. However, Patent Owner fails to meet the requirements of 37 C.F.R. §42.121 for several reasons. Thus, the Motion should be denied.

First, the Patent Owner never introduced the ’510 Application as an exhibit and therefore it is not part of the record. Under 37 C.F.R. § 42.63 (a) “All evidence must be filed in the form of an exhibit.” Thus, the Patent Owner submitted no evidence to support that its amendment is proper under 37 C.F.R.

§42.121. Second, the Patent Owner fails to identify support in the original disclosure for **all limitations of all Substitute Claims** as required under 37 C.F.R. §42.121(b). *Western Digital Corp. v. Spex Technologies, Inc.*, Case IPR2018-00082 (PTAB Apr. 25, 2018)(Paper 13)(informative)(“The motion must set forth written description support for each proposed substitute claim as a whole, and not just the features added by the amendment. This applies equally to independent claims and dependent claims, even if the only amendment to the dependent claims is in the identification of the claim from which it depends.”). The Patent Owner lists citations for **only** for the newly added limitations, and **only** for Substitute Claim 25. Motion p. 5-6. Because the Motion does not address each Substitute Claim 25-29, nor each limitation in the Substitute Claims as required, the Motion should be denied.

Third, none of the citations identified by Patent Owner describe traffic packet characteristics as requiring packet header information and something more than packet header information. The Motion identifies seven string cites to the ’510 Application, but Patent Owner makes no attempt to explain how these citations support the added limitations. Nor does the Patent Owner submit the testimony of a POSA to identify how the original disclosure supports the Substitute Claims. It is not sufficient that Patent Owner identifies that the original disclosure discloses that traffic packet characteristics can include header information and non-

header information. The original disclosure must support the claimed invention, including that header and non-header information is used in each of the “obtaining”, “comparing”, and “grouping” limitations. *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997) (“[I]t is not a question of whether one skilled in the art *might* be able to construct the patentee’s device from the teachings of the disclosure [but] whether the application necessarily discloses that particular device.” (internal citation and quotation omitted) (cited with approval in *Ariad Pharm., Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010))).

Thus, the Motion should be denied for failure to comply with 37 C.F.R. §42.121.

B. The Substitute Claims Are Indefinite Under 35 U.S.C. § 112

The amendment fails to particularly point out and distinctly define the metes and bounds of the subject matter to be protected by the patent grant. Whether “the traffic packet characteristics” recited in the added wherein clause of the amendment refers back to the “traffic packet characteristics” of the “obtaining” limitation, the “comparing” limitation, the “grouping” limitation, some of these limitations, or all of these limitations is not clear.

Nothing in the Substitute Claims specifies that all traffic packet characteristics, including the packet header information and the “more than packet header information” are required for each of the obtaining, comparing, and

grouping steps. For example, it is unclear whether the “comparing” limitation would be met by comparing only header information of packets, so long as the “obtaining” limitation obtained information that was more than packet header information. In other words, as presently recited, the claims are unclear as to whether “more than header information” is to be used in each of the “obtaining”, “comparing” and “grouping” limitations. Thus, the addition of the wherein clause in the Substitute Claims leads to an ambiguous and undefined scope which does not satisfy the requirements of 35 U.S.C. §112. *Amazon.Com, Inc. V. Uniloc Luxembourg S.A.*, Case IPR2017-00948 (PTAB Jan. 18, 2019)(Paper 34)(The Board may rely on §112 to evaluate amended claims for unpatentability.).

IV. THE SUBSTITUTE CLAIMS ARE UNPATENTABLE OVER THE ART CITED IN THE PETITION, OR OVER THE NEWLY CITED

A. Pappu And Peleg Disclose That Traffic Packet Characteristics Include More Than Packet Header Information

Notwithstanding the 35 U.S.C. §112 issue discussed above, the Substitute Claims are unpatentable whether the wherein clause applies to each of the of the “obtaining”, “comparing” and “grouping” limitations, or just to some of them, as set forth below.

In view of *Aqua Products, Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017), the Board will proceed to determine whether the substitute claims are unpatentable by a preponderance of the evidence *based on the entirety of the record, including any*

opposition made by the petitioner. Chief Administrative Patent Judge, Guidance on Motions to Amend in view of *Aqua Products*, November 21, 2017.

To the extent that the Patent Owner’s proposed amendment requires that the traffic packet characteristics disclosed in Peleg and Pappu include “more than packet header information” but do not require that each of the “obtaining”, “comparing”, and “grouping” limitations requires the use of more than header information, then the Petition sets forth where each of the limitations is found in Ground 1, in view of the fact that both Pappu and Peleg disclose traffic packet characteristics that include “more than packet header information.” Petition 27-57.

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; 8:16-25; *PAN-1003* ¶100.

Specifically, Pappu discloses flow rate and inter-arrival period as behavioral characteristics. *PAN-1004* 14:57-15:4; *PAN-1003* ¶114.

Peleg discloses gathering 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 packet header information, and inter-arrival times between packets. *PAN-1005* 6:48-54; 7:16-20; *PAN-1003* ¶60.

Thus, because both Pappu and Peleg discloses “traffic packet characteristics” having “more than packet header information,” the Petition sets forth in Ground 1 how the Substitute Claims are unpatentable.

B. The Substitute Claims Are Obvious In View Of Pappu Alone, Or In Combination with Peleg, And/Or In Combination with Duffield

To the extent the Board considers that the wherein amendment modifies each of the steps of “obtaining”, “comparing” and “grouping” to affirmatively operate on the packet header information and also “more than packet header information,” Pappu in view of Peleg, in further view of Duffield, discloses each of those limitations including by using packet header information and “more than packet header information,” such as inter-arrival period and instantaneous flow.

1. Pappu And Peleg Disclose Grouping Packets Using More Than Packet Header Information

The Motion asserts that “both *Pappu* and *Peleg* describe using *header-only data* for traffic management. Neither *Pappu* nor *Peleg* disclose *wherein the traffic packet characteristics comprise parameters associated with a traffic packet, the parameters including more than packet header information.*” Motion 6

(emphasis in original). This statement contradicts the express disclosures of Pappu and Peleg.

The Petition sets forth how Pappu and Peleg disclose the use of traffic packet characteristics in the form of header information to identify and classify flows/sessions. Petition 27-57. However, Pappu and Peleg are not limited to traffic packet characteristics in the form of header information.

As discussed above, Pappu teaches that flows can be identified and classified based on behavioral characteristics, not just based on packet header information. *PAN-1004* 2:41-47.

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:
said flow being incapable of being identified by header information alone;

PAN-1004 Claim 1 (emphasis added).

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.

Pappu teaches that information that is not contained in the packets includes the 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. Thus, Pappu expressly provides a motivation for a POSA to group packets into flows, and therefore a POSA would be motivated to use the behavioral statistics disclosed by Pappu to group the packets in a meaningful way to allow the traffic to be understood at a higher level.

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 (citing to Duffield). Flow level statistics include packet length, 5-tuple packet header 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, to then group 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 transmissions over a short period of time) of a traffic stream.

Intraflow/connection features include loss rates and latencies, among other examples. *PAN-1005* 7:20-24; *PAN-1003* ¶60.

Peleg also disclosed using flow analysis to group packets. Like the '629 Patent, Peleg calls packets grouped by common characteristics a session:

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].

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 using a classifier to group 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.

2. Duffield Discloses Grouping Packets Using More Than Packet Header Information

U.S. Pat. No. 7,660,248 issued on February 9, 2010 from U.S. Appn. Ser. No. 10/764,001 filed on June 23, 2004 (“Duffield”). It qualifies as prior art under §102(b). It was not cited or applied by the Patent Office during prosecution of the patent. Duffield was discussed in the State of the Art in the Petition (at 22-23,25).

Duffield discloses grouping packets into preselected classes of services based on traffic features. *PAN-1005* 2:63-67. In one embodiment, the preselected classes of service include interactive traffic, bulk data transfer traffic, streaming traffic, and transactional traffic. *Id.* The traffic features include packet-level features such as packet size, flow-level statistics (based on flow-level features such as the 5-tuple), and intra-flow/connection features including the inter-arrival times

between packets. *PAN-1005* 6:28-7:24. Duffield discloses assigning packets to the preselected classes based on the traffic features, including 5-tuple packet header information, and including features that are “more than packet header information” such as inter-arrival times. *PAN-1005* 5:7-14; FIG. 1; *PAN-1011* ¶19.

Like Pappu and Peleg, Duffield disparages port analysis alone and full content analysis, stating that methods that rely solely on port analysis or content analysis were not reliable due to the dynamic nature of ports and/or the use of encryption. *PAN-1005* 3:41-5:5.

3. Detailed Application Of Pappu, Peleg, And Duffield To The Substitute Claims

a. SUBSTITUTE CLAIM 25

i. *A method of identifying session type, comprising:*

Pappu discloses a method of “identifying, classifying, and controlling information packet flows in a network”. *PAN-1004* Abstract, 2:34-44; *PAN-1003* ¶91; Pet. p. 38-39; *PAN-1011* ¶21

ii. *obtaining passing packets of respectively unknown sessions and unknown session types;*

Pappu discloses receiving and processing of packets (*obtaining passing packets*) including packets that do “not match any previously established flow”. (*unknown sessions and unknown session types*). *PAN-1004* 7:4-6; *PAN-1003* ¶93; Pet. p. 39-40; *PAN-1011* ¶22

iii. obtaining traffic packet characteristics of said passing packets of respectively unknown session types;

Pappu discloses obtaining certain header information including the 5-tuple packet header information. *PAN-1004* 6:17-26; *PAN-1003* ¶94; Pet. 40. Pappu also discloses obtaining non-header packet information. Specifically, Pappu discloses that as the packets of a flow are processed, a set of behavioral statistics are maintained for the flow. *PAN-1004* Fig. 3; *PAN-1003* ¶78; Pet. 31-32. These behavioral statistics reflect the empirical behavior of the flow and are stored in the flow block for that flow. *PAN-1004* 7:21-24; *PAN-1003* ¶79. These behavioral statistics which are obtained include non-header packet information such as average inter-packet gap (inter-arrival period), flow rate, and instantaneous flow rate, each of which are packet characteristics that are more than packet header information. *PAN-1004* Fig. 4; *PAN-1003* ¶79; Pet. 32-33. Pappu's Fig. 4 discloses "average inter-packet gap", 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. Thus, a POSA understood that Pappu discloses determining the inter-packet gap between successive packets to derive the average inter-packet gap and to derive flow rate. *PAN-1011* ¶23.

Therefore, Pappu discloses obtaining traffic packet characteristics of said passing packets of respectively unknown session types, including the 5-tuple packet header information and behavioral characteristics which are more than packet header information.

iv. comparing said obtained packets with each other using respectively obtained traffic packet characteristics;

Pappu discloses comparing parameters associated with traffic packets with parameters of other packets to determine if they share sufficient information.

PAN-1004 6:17-26; *PAN-1003* ¶¶97,98; Pet. 41-42; *PAN-1011* ¶24.

Pappu teaches that flows can be identified and classified based on behavioral statistics,² not just based on packet header information. *PAN-1004* 2:37-53; *PAN-1003* ¶72; Pet. 28-29. These behavioral statistics include characteristics of traffic packets such as inter-packet gap (inter-arrival period), flow rate, and instantaneous flow rate. *PAN-1004* Fig. 4; *PAN-1003* ¶79; Pet. 32-33. Using these characteristics and others, Pappu creates a flow block for each previously identified flow. A flow block is a data structure containing behavioral statistics of the flow. When a packet arrives at a router, the router checks to see if it “matches” an existing “flow block” data: “If the packet matches an existing flow block, then

² Pappu uses the words behavioral statistics and behavioral characteristics interchangeably. See *PAN-1004* Title vs Abstract.

the packet is deemed to belong to the flow that corresponds to that flow block.”

PAN-1004 7:9-16; *PAN-1003* ¶78. When Pappu matches based on “flow blocks” in which the behavioral statistics for that flow are stored, it is comparing packets based on traffic packet characteristics that includes more than packet header information. *PAN-1011* ¶25.

To the extent Patent Owner argues that Pappu only discloses comparing packets based upon header information, it would have been obvious to a POSA to modify Pappu to include comparison of non-header information. *PAN-1011* ¶26.

As described in Pappu, the type or classification of a flow may be determined by individual and/or aggregate characteristics of the packets within the flows. *PAN-1004* 13:20-38; *PAN-1003* ¶76-81. Inter-packet gaps and instantaneous data rate are examples of packet characteristics that discriminate different flow types. Individual packets having characteristics associated with the type/classification of a flow are more likely to belong to that particular flow than are packets having characteristics that do not match. *PAN-1011* ¶27. For example, packets exhibiting characteristics of a VoIP packet is an indication that the packets are part of a VoIP flow. The more characteristics in common, the more likely the packets belong to the same flow or session. *PAN-1011* ¶27. Thus, a POSA understood that the behavioral statistics used to identify the type of traffic could also be used to group the packets, and identifying commonality in packets

facilitates grouping. *PAN-1011* ¶27. Thus, a POSA would be motivated to compare packets based on the behavioral statistics of inter-arrival gap and instantaneous flow rate, as well as header information in order to more effectively group the packets into flows (*sessions*). *PAN-1011* ¶27.

Pappu expressly provides the motivation to compare more than packet header information: “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* 6:29-3; *PAN-1011* ¶28. Moreover, these non-header parameters are relatively easily gathered and helps inform the system as to grouping and classification. Therefore, a POSA would be motivated to compare packets using the behavior statistics disclosed by Pappu in order to group the packets in a meaningful way. *PAN-1011* ¶28. A POSA would also be confident in success of the modification, given the established use of identifying flows based upon these behavioral statistics. *PAN-1011* ¶28.

v. grouping together those packets having similar values of said traffic packet characteristics into a presumed session;

Pappu discloses grouping packets together that match an existing flow block data structure in an existing flow. *PAN-1004* 6:63-66,7:4-6; *PAN-1003* ¶93. Pet. 39-40; *PAN-1011* ¶29.

As is described in greater detail below, in one embodiment of the invention, when FM 210 receives a packet, FM 210 determines

whether that packet matches any existing “flow block” data structure.

If the packet matches an existing flow block, then the packet is deemed to belong to the flow that corresponds to that flow block.

Alternatively, if the packet does not match an existing flow block, then FM 210 creates a new flow block for a new flow to which the packet is deemed to belong.

PAN-1005 7:7-16; *PAN-1003* ¶93; Pet. 39-40; *PAN-1011* ¶29.

As described in Section V.A.3. a.iv (above), Pappu, as modified by the knowledge of one skilled in the art, teaches comparing packets using non-header traffic characteristics as well as packet header information to determine if the packets match one another. *PAN-1011* ¶30. Based on the match the packets are grouped. *PAN-1011* ¶30. As noted above, a POSA would have been motivated to use these characteristics to group packets “to allow the traffic flowing through router 102 to be understood at a higher level.” *PAN 1004* 6:29-32. *PAN-1011* ¶30.

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* ¶31.

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:

...

said flow being incapable of being identified by header information alone;

...

PAN-1004 Claim 1 (emphasis added); *PAN-1011* ¶32.

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* ¶33.

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-1011* ¶34.

As the Petition describes, grouping packets in a presumed session would also have been obvious in view of Peleg. *PAN-1004* 6:38-42; *PAN 1006* [0041,47]; *PAN-1003* ¶¶103-104; Pet. 43-45. In one embodiment, Peleg describes using a classifier to group 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 packet 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 for a flow that is “incapable of being identified by header information alone.” *PAN-1004* Claim 1. *PAN-1011* ¶35

Grouping packets having similar non-header traffic packet characteristics would also have been obvious in view of Duffield. *PAN-1011* ¶36.

Duffield describes developing attributes based on traffic features and grouping arriving packets based on these attributes into different classes of service:

Specifically, the disclosed method assigns traffic to classes based on selected attribute or attributes based on a mapping derived from a statistical analysis that forms a signature for traffic having particular values for those attributes.

PAN-1005 5:7-14; FIG. 1. *PAN-1011* ¶37.

Duffield discloses assigning packets to the preselected classes based on traffic features, including features such as 5-tuple packet header information and also features that are “more than packet header information” such as inter-arrival times. *PAN-1005* 5:7-14; FIG. 1; *PAN-1011* ¶38.

It would have been obvious to a POSA, to modify Pappu to group arriving packets using header information and non-header information (such as inter-arrival period) as disclosed in Duffield, because Pappu recognizes 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* 6:29-3; *PAN-1011* ¶39. Thus, Pappu expressly provides a motivation for a POSA to aggregate/group packets and Duffield discloses the grouping of packets using non-header traffic features such as inter-arrival period. Therefore, a POSA would be motivated to use, among other attributes, inter-arrival period as taught by Duffield in order to group the packets in a meaningful way. *PAN-1011* ¶39. A POSA would also be confident in success of the modification, as both Pappu and Duffield disclose the use of inter-arrival period (*PAN-1004* Fig. 4; *PAN-1005*, 5:15-24) and that packets may be grouped together by common features (*PAN-1004* 13:20-38; *PAN-1005* 6:22-7:41); *PAN-1011* ¶39.

vi. analyzing said grouped packets of said presumed session for session characteristic; and

The Petition demonstrates that Pappu discloses obtaining behavioral statistics (*session characteristics*) of the passing packets of the previously unknown flow (*presumed session*). *PAN-1004* 7:21-50, 14:50--15:5, Figs. 3, 4; *PAN-1003* ¶¶105-108. Pet. 46-48; *PAN-1011* ¶40.

vii. using said session characteristics to identify a session type of said presumed session,

The Petition demonstrates that Pappu discloses using behavioral statistics (*session characteristics*) to identify the type of traffic (*session type*) represented by the flow (*presumed session*). *PAN-1004* 8:26-27, 9:39-48, 10:17-27; *PAN-1003* ¶¶109-110; Pet. 48-49; *PAN-1011* ¶41.

- viii. wherein the traffic packet characteristics comprise parameters associated with a traffic packet, the parameters including more than packet header information; and**

As discussed above, Pappu alone, in view of Peleg, or in further view of Duffield, discloses obtaining, comparing and grouping using “traffic packet characteristics” that “comprise parameters associated with a traffic packet, the parameters including more than packet header information.” *PAN-1011* ¶42.

- ix. wherein said identifying a session type is followed by at least one of the group comprising: providing provisioning and providing control actions to the presumed session.**

The Petition demonstrates that Pappu describes applying user specified actions (*control actions*) to the flow (*presumed session*) based on the prior step of identifying of flow type (*session type*). *PAN-1004* 3:4-30,11:60-13:16; *PAN-1003* ¶¶111-112; Pet. 49-51; *PAN-1011* ¶43.

b. DEPENDENT SUBSTITUTE CLAIM 26-29

The Petition demonstrates that Pappu describes all the limitations of Substitute Claims 26-29 which correspond to Claims 18, 20, 21 and 22. Pet. 51-55; *PAN-1011* ¶44.

V. CONCLUSION

For the reasons discussed above, the Motion to Amend should be denied.

Respectfully submitted,

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By: /Patrick D. McPherson/
Patrick D. McPherson
USPTO Reg. No. 46,255
Duane Morris LLP
505 9th Street NW, Suite 1000
Washington, D.C. 20004
LEAD COUNSEL FOR
PETITIONERS

CERTIFICATE OF SERVICE ON PATENT OWNER
UNDER 37 C.F.R. § 42.6(e)

Pursuant to 37 C.F.R. §§ 42.6(e), the undersigned certifies that on the 21st day of February 2019, a complete and entire copy of this Opposition to Patent Owner's Motion to Amend and all supporting exhibits not already of record in this proceeding were provided via the Patent Trial and Appeal Board End to End (PTAB E2E) System as well as delivering a copy via email on the following counsel for Patent Owner at:

jtoler@tlgiplaw.com

bjohnson@tlgiplaw.com

Dated: February 21, 2019

By: /Patrick D. McPherson/
Patrick D. McPherson
USPTO Reg. No. 46,255
Duane Morris LLP
505 9th Street NW, Suite 1000
Washington, D.C. 20004
LEAD COUNSEL FOR
PETITIONERS