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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/614,956	06/06/2017	Sean Moore	007742.00091\US	9334

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BANNER & WITCOFF, LTD.
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EXAMINER
NGUYEN, ANH NGOC M

ART UNIT	PAPER NUMBER
2473	

NOTIFICATION DATE	DELIVERY MODE
12/07/2022	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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In re Application of	:	
Centripetal Networks, Inc.	:	
Application No. 15/614,956	:	DECISION ON PETITION
Filed: 6 Jun 2017	:	
For: FILTERING NETWORK DATA TRANSFERS	:	
:		

This is a notice regarding the request for acceptance of a fee deficiency submission under 37 CFR 1.28(c) filed July 17, 2022.

On September 1, 1998, the Court of Appeals for the Federal Circuit held that 37 CFR 1.28(c) is the sole provision governing the time for correction of the erroneous payment of the issue fee as a small entity. **See DH Technology v. Synergystex International, Inc. 154 F.3d 1333, 47 USPQ2d 1865 (Fed. Cir. Sept. 1, 1998).**

The Office no longer investigates or rejects original or reissue applications under 37 CFR 1.56. **1098 Off. Gaz. Pat. Office 502 (January 3, 1989)**. Therefore, nothing in this Notice is intended to imply that an investigation was done.

The fee deficiency submission under 37 CFR 1.28(c) is hereby **ACCEPTED**.

The loss of entitlement to small entity status occurred prior to the earliest of the noted payments stated in the request. The application regained entitlement to small entity status of January 1, 2022, and Accordingly, all future fees paid in this application should be paid at the small entity rate.

Inquiries related to this communication should be directed to the undersigned at (571) 272-2991.

/TERRI S JOHNSON/
Paralegal Specialist, OPET

Document Code:WFEE

User :Suad Mohammed

Sale Accounting Date:12/02/2022

Sale Item Reference Number	Effective Date
15614956	07/17/2022

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I2022B2E35051589	1461	1.28(C) SUBMISSIONS - APPLIC FILE FEE	$2,670.00	Deposit Account

Docket No.: 007742.00091\US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. Patent No. 10,567,343

Inventor: Sean Moore

Application No.: 15/614,956 Confirmation No.: 9334

Filed: June 6, 2017 Art Unit: 2473

For: Filtering Network Data Transfers Examiner: A. N. M. Nguyen

NOTICE OF TEMPORARY LOSS OF ENTITLEMENT TO SMALL ENTITY STATUS AND PAYMENT OF DEFICIENCY OF FEES OWED

U.S. Patent and Trademark Office
Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Sir:

In accordance with 37 C.F.R. § 1.28(c), Applicant recently realized that it was not entitled to small entity status at the time it made certain payments to the Office as noted in the table below, and Applicant submits this payment of deficiency of fees owed. The loss of entitlement to small entity status occurred prior to the earliest of the below-noted payments. Applicant's failure to previously notify the Office of the loss of entitlement to small entity status as required by 37 C.F.R. § 1.27(g)(2) occurred in good faith and without any deceptive intent.

Applicant regained entitlement to small entity status as of January 1, 2022, and Applicant claims small entity status as of that date and continuing through the present date.

As required by 37 C.F.R. § 1.28(c)(1) and (2), Applicant itemizes the deficiency of fees owed for the above-identified application as follows:

Type of Fee	Date Paid	Fee Paid	Current Fee	Deficiency Owed
Utility issue fee (Fee Code 2501)	1/6/2020	500.00	1,200.00	700.00
Request for RCE – 1st request (Fee Code 2801)	11/8/2019	650.00	1,360.00	710.00
Extension for response within second month (Fee Code 2252)	11/4/2019	300.00	640.00	340.00
Submission of an Information Disclosure Statement (Fee Code 2806)	3/28/2019	120.00	260.00	140.00
Extension for response within third month (Fee Code 2253)	3/27/2019	700.00	1,480.00	780.00
TOTAL		**2,270.00**	**4,940.00**	**2,670.00**

Total deficiency owed is $4,940.00 - $2,270.00 = $2,670.00

The Commissioner is authorized to charge the requisite fees owed to Deposit Account No. 19-0733.

If any other fees are required or if an overpayment is made, the Commissioner is authorized to debit or credit our Deposit Account No. 19-0733, accordingly.

Respectfully submitted,

BANNER & WITCOFF, LTD.

Dated: July 17, 2022

By: /Scott M Kelly/
Scott M. Kelly
Registration No. 65,121

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Electronic Acknowledgement Receipt

EFS ID:	46206531
Application Number:	15614956
International Application Number:	
Confirmation Number:	9334
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Customer Number:	22907
Filer:	Christopher L. Mckee/Jennifer Hazzard
Filer Authorized By:	Christopher L. Mckee
Attorney Docket Number:	007742.00091\US
Receipt Date:	17-JUL-2022
Filing Date:	06-JUN-2017
Time Stamp:	13:19:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Notification of loss of entitlement to small entity status	Loss_of_Entitlement_to_Small_Entity_Status_and_Payment_of_Deficiency_in_Fees_Owed__22014841.pdf	22683 abea98c86966c76ae480d9736d65bcbe66e24d3a	no	2

Warnings:

Information:	
Total Files Size (in bytes):	22683

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Trials@uspto.gov
571-272-7822

Paper: 12
Entered: January 20, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PALO ALTO NETWORKS, INC.,
Petitioner,

v.

CENTRIPETAL NETWORKS, INC.,
Patent Owner.

IPR2021-01155
Patent 10,567,343 B2

Before BRYAN F. MOORE, LYNNE E. PETTIGREW, and JON M. JURGOVAN, *Administrative Patent Judges.*

JURGOVAN, *Administrative Patent Judge.*

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Palo Alto Networks, Inc. ("Petitioner") filed a Petition requesting *inter partes* review of claims 1–20 of U.S. Patent No. 10,567,343 B2 (Ex. 1001, "the '343 patent"). Paper 1 ("Pet."), 1. Centripetal Networks, LLC ("Patent Owner") filed a Preliminary Response. Paper 8 ("Prelim. Resp."). Petitioner filed a Preliminary Reply (Paper 9), and Patent Owner filed a Preliminary Sur-Reply (Paper 10), to address discretionary denial under § 314(a).

We have jurisdiction and authority to institute trial pursuant to 35 U.S.C. §§ 6 and 314(a), and 37 C.F.R. § 42.4(a). Upon consideration of the Petition and Preliminary Response, we exercise our discretion to decline institution of *inter partes* review under § 325(d).

II. BACKGROUND

A. Real Parties-in-Interest

Petitioner and Patent Owner identify themselves as the only real parties-in-interest involved in this case. Pet. 2, Paper 5, 1.

B. Related Matters

Petitioner and Patent Owner identify the following as matters that can affect or be affected by this proceeding. *See* Pet. 3; Paper 5, 1; Paper 7, 2; Prelim. Resp. 1.

- *Centripetal Networks, Inc. v. Palo Alto Networks, Inc.*, 2:21-cv-00137 (EDVA Mar. 12, 2021)
- *Centripetal Networks, Inc. v. Cisco Systems, Inc.*, 847 F. App'x 869 (Fed. Cir. 2021) (decision on appeal of final decisions in IPR2018-01436 involving US 9,124,522 ("the '552 patent") and IPR2018-01437 involving US Patent 9,160,713 ("the '713 patent")

- *Centripetal Networks, Inc. v. Cisco Systems, Inc.*, 21-193 (U.S. Oct. 4, 2021) (denying Patent Owner's petition for writ of certiorari)
- Reexamination of US 9,686,193 B2 ("the '193 patent") (confirming patentability of claims 1–20).

C. Overview of the '343 Patent

The '343 patent is titled "Filtering Network Data Transfers" and describes receiving multiple packets and determining whether their packet header field values correspond to a packet filtering rule. Ex. 1001, codes (54), (57). If so, an operator determines whether the filtered packets have application header field values corresponding to criteria specified by the operator. *Id.* at code (57). If so, the operator applies a packet transformation function to the header of the filtered packets. *Id.* The packet transformation function is configured to prevent an exfiltration operation. *Id.* This blocks packets from flowing from the inside to the outside of a protected network to prevent loss of confidential or sensitive information. *Id.* at 2:40–47.

Figure 1 of the '343 patent is reproduced below.

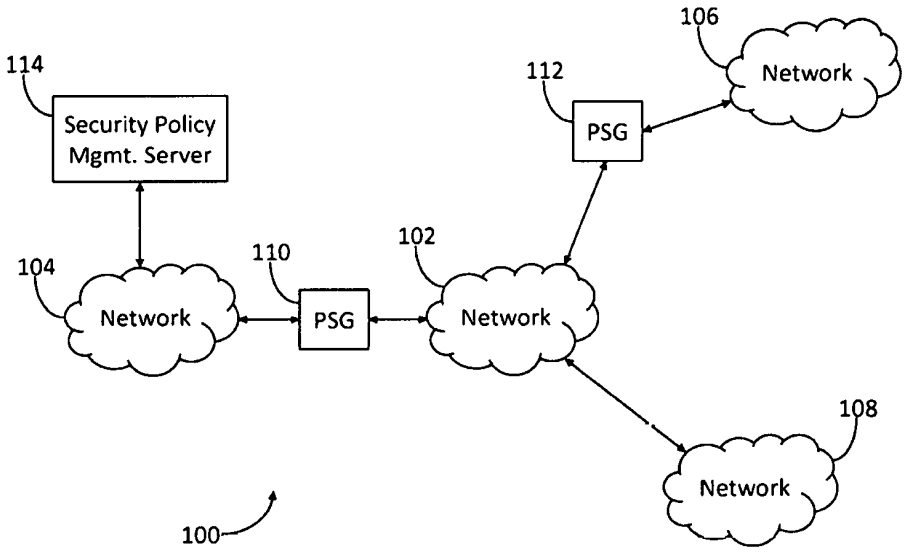


FIG. 1

Figure 2 of the '343 patent is reproduced below.

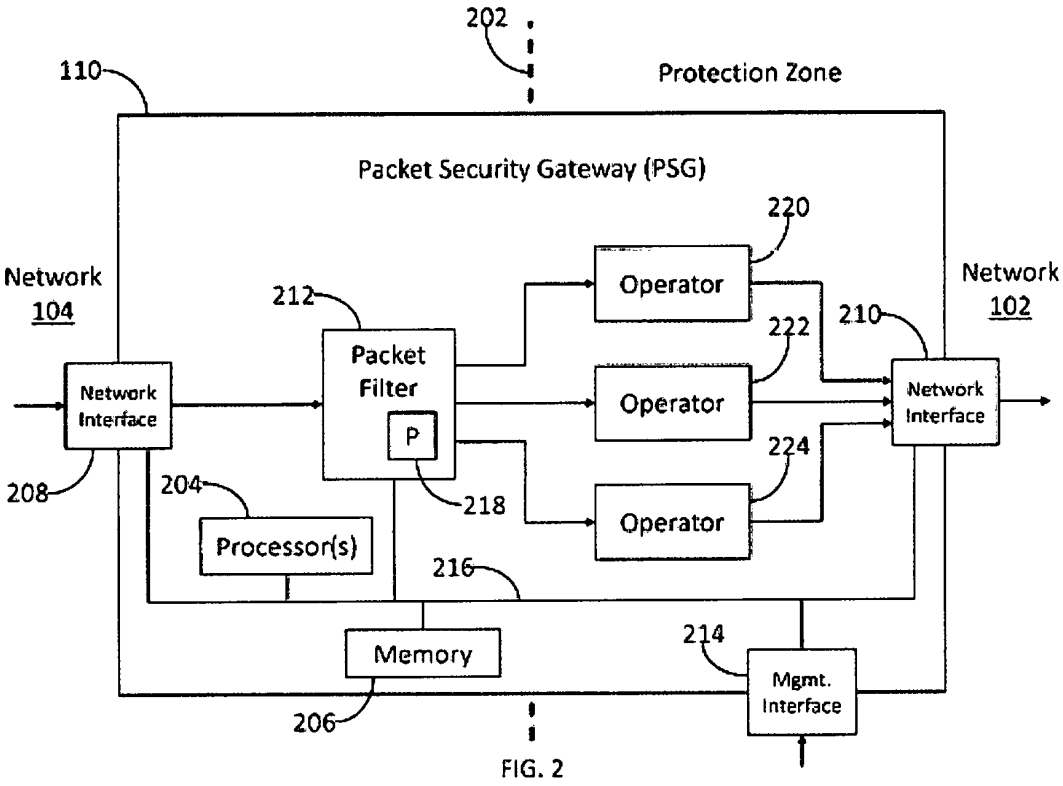


FIG. 2

Figure 3 of the '343 patent is reproduced below.

218

Five-tuple

Rule #	IP Protocol	Source IP Address	Source Port	Destination IP Address	Destination Port	Operator
1 (302)	TCP	140.210.*	*	140.212.*	22	ALLOW
2 (304)	TCP	140.210.*	*	140.212.*	25	ALLOW
3 (306)	TCP	140.210.*	*	140.212.*	110	ALLOW
4 (308)	TCP	140.210.*	*	140.212.*	143	ALLOW
5 (310)	TCP	140.210.*	*	140.212.*	443	REQUIRE-TLS-1.1-1.2
6 (312)	TCP	140.210.*	*	214.*	80	HTTP-EXFIL
7 (314)	*	*	*	*	*	BLOCK

FIG. 3

Figure 3 shows dynamic security policy 218 including rules specifying criteria and operators. *Id.* at 5:50–64. For example, Rule 6 specifies that packets originating from a source IP address that begins with 140.210, having any source port, destined for an IP address that begins with 200.214[1], and destined for port 80 should have the HTTP-EXFIL operator applied to them. *Id.* at 7:4–9. The HTTP-EXFIL operator may allow HTTP packets containing a GET method, but block HTTP packets containing other HTTP methods (e.g., PUT, POST, CONNECT, etc.). *Id.* at 7:9–23.

Figure 4 of the '343 patent is reproduced below.

[1] Figure 3 shows the destination IP address as "214.*" whereas the text of the '343 patent indicates "200.214." Accordingly, there appears to be an error in either the figure or the text because the two are not consistent.

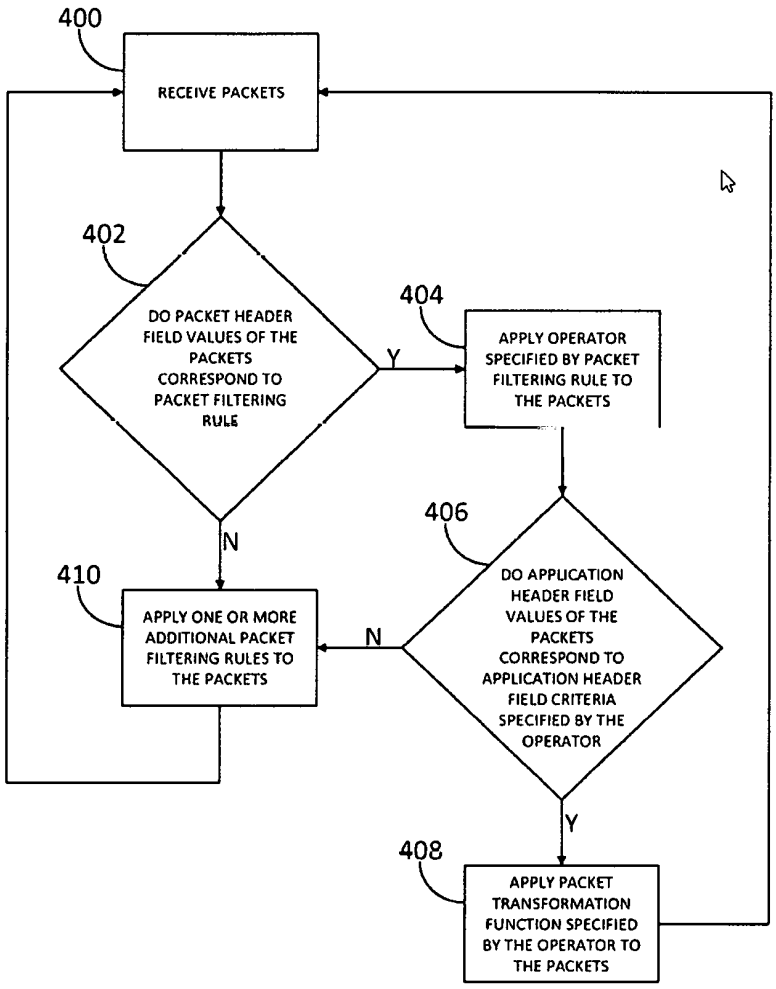


FIG. 4

Figure 4 illustrates a method for protecting a secured network by enforcing one or more network usage policies or network security policies. *Id.* at 3:12–15. Step 400 receives packets. *Id.* at 9:18–19. Step 402 determines whether packet field values correspond to a packet filter rule. *Id.* at 9:22–24. Step 404 applies an operator to the packet. *Id.* at 9:30–35. Step 406 determines whether application header field values of packets correspond to criteria specified by operator. *Id.* at 9:38–42. Step 408 applies a packet transformation function specified by the operator to the packets. *Id.* at

9:47–53.

Claims 1, 8, and 15 of the '343 patent are independent claims reciting corresponding method, apparatus, and computer-readable media. *Id.* at 11:28–61; 12:46–13:10; 14:1–32. The remaining claims depend from one of these claims. Claim 1, which is illustrative, is reproduced below.

> A method comprising:
>
> receiving, by a computing system comprising memory and at least one processor, a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets;
>
> determining, based on a packet header field value, whether each packet of the plurality of packets comprises data corresponding to first criterion specified by one or more packet-filtering rules;
>
> responsive to a determination by the computing system that a packet header field value of the first portion of packets comprises data corresponding to the first criterion specified by at least one matching packet-filtering rule, applying, by the computing system and to each packet in the first portion of packets, one or more operators specified by the at least one matching packet-filtering rule;
>
> determining, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule; and
>
> responsive to determining the second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, applying, by the computing system and to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to prevent an exfiltration operation, wherein the at least one packet

transformation function indicates whether each packet in the second portion of packets is allowed to continue toward its destination.

Id. at 11:28–61.

D. Evidence of Record Relied Upon[2]

Reference		Date	Exhibit No.
Sourcefire	Sourcefire 3D System User Guide, Version 4.10	Mar. 16, 2011	1004
Mantripragada	US 2009/0103524 A1	Apr. 23, 2009	1007

Pet. 4–6.

E. Asserted Challenges to Patentability

Claim Challenged	Basis	Reference(s)
1–6, 8–13, 15–19	§ 103	Sourcefire
7, 14, 20	§ 103	Sourcefire, Mantripragada

Pet. 6.

F. Procedural History

The '343 patent is a continuation of US Application 14/625,486, which issued as US 9,686,193 B2 ("the '193 patent"). Ex. 1001, code (63). The '193 patent's claims do not recite explicitly "to prevent an exfiltration operation" like the '343 patent's do. However, the '193 patent claims apply packet-filtering rules to prevent data transfer from a first network to a

[2] Petitioner also relies upon the Declaration of Dr. Robert Akl (Ex. 1003).

second network, so the '193 patent is similar to the '343 patent in this respect.

A petitioner (not the same one as here) challenged the '193 patent in IPR2018-01559. Ex. 1045. The Board denied institution because the petitioner had not shown that the claimed operator was taught or suggested by Sourcefire. *Id.*

The '193 patent was also reexamined. Ex. 2010. The Office issued a reexamination certificate confirming the patentability of all claims of the '193 patent. *Id.* at 604–605. The claims were confirmed as patentable over Sourcefire because they recite a filtering process applying a first operator to drop packets associated with a particular type of data transfer (i.e., preventing exfiltration) and a second operator to forward packets not associated with a particular type of data transfer toward a third network. *Id.* at 584–586, 595–596.

The '193 patent is a continuation of US Application 13/795,822, which issued as US 9,124,552 B2 ("the '552 patent"). Ex. 1001, code (63). US 9,160,713 B2 ("the '713 patent") is also a continuation of this application. IPR2018-01437, Ex. 1001, code (63). The '552 patent was challenged by a petitioner in IPR2018-01436, and the Board determined all of the '552 patent's claims were unpatentable over Sourcefire. Ex. 1042. The Board also found all claims of the '713 patent unpatentable over Sourcefire in IPR2018-01437. These decisions were affirmed by the U.S. Court of Appeals for the Federal Circuit. *Centripetal Networks, Inc. v. Cisco Sys., Inc.*, 847 Fed. App'x. 869 (Fed. Cir. 2021).

III. ANALYSIS

A. Discretionary Denial Under 35 U.S.C. § 325(d)

Under § 325(d), in determining whether to institute an *inter partes* review, "the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office." In evaluating arguments under § 325(d), we use a two-part framework: (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of the first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential) ("*Advanced Bionics*"). We also consider the non-exclusive factors set forth in *Becton, Dickinson and Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017) (precedential in relevant part) ("*Becton, Dickinson*"), which "provide useful insight into how to apply the framework" under § 325(d). *Advanced Bionics* at 9. Those non-exclusive factors are the following:

> (a) the similarities and material differences between the asserted art and the prior art involved during examination;
>
> (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
>
> (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;

> (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;
>
> (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and
>
> (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson at 17–18. "If, after review of factors (a), (b), and (d), it is determined that the same or substantially the same art or arguments previously were presented to the Office, then factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office." *Advanced Bionics* at 10.

B. Petitioner's Contentions

Petitioner contends that the Board should not exercise its discretion to deny institution under § 325(d). Pet. 8. Petitioner contends that the grounds raised by this Petition are not the same or substantially the same as the art and arguments raised during prosecution. *Id.* at 8–9. Petitioner acknowledges that Sourcefire and several IPR papers addressing the related '552 and '193 patents were cited in an information disclosure statement (IDS) in the prosecution history of the '343 patent. *Id.* at 9 (citing Ex. 1002, 1313). However, Petitioner contends that they were not substantively discussed or applied in a rejection during prosecution. *Id.* at 9 (citing *Vizio, Inc. v. Nichia Corp.*, IPR2017-00551, Paper 9, *7–8 (PTAB July 7, 2017); and *Microsoft Corp. v. Parallel Networks, LLC*, IPR2015-00486, Paper 10, *14–15 (PTAB July 15, 2015)). Petitioner contends that Sourcefire is not cumulative of the references considered during prosecution, and that

Sourcefire teaches the two-stage packet filtering process that the Examiner found missing from the prior art during prosecution. *Id.*

Petitioner contends that the Examiner erred by not expressly considering Sourcefire and that it is "difficult, if not impossible" to explain why the Examiner allowed the claims or how the Examiner might have considered the arguments presented in the Petition. Pet. 9–10 (citing *Bowtech, Inc. v. MCP, IP, LLC*, IPR2019-00379, Paper 14, *20 (PTAB July 3, 2019)).

Petitioner further contends the Examiner erred by not considering the Board's analysis of Sourcefire in IPR2018-01436 against the '552 patent explaining how limitations of the challenged claims are met. *Id.* (citing *SK Hynix v. Netlist*, IPR2020-01042, Paper 14, *20–21 (PTAB Dec. 17, 2020); *Amazon v. M2M*, IPR2019-01205, Paper 14, *12–16 (PTAB Jan. 27, 2020); *Versa Prods. v. Varidesk, LLC*, IPR2020-00387, Paper 13, *15–18 (PTAB July 10, 2020)). Petitioner contends the Examiner's error is confirmed by the Federal Circuit's affirmance of the Board's determination that all claims of the '552 patent were unpatentable over Sourcefire. Pet. 11–12 (citing Ex. 1042, 70; Ex. 1043).

C. Patent Owner's Contentions

Patent Owner contends that the Board should deny institution under § 325(d) because the Petition reuses the same art and arguments that were previously presented to the Office. Prelim. Resp. 25. Patent Owner contends the Office issued the '343 patent over Sourcefire, as well as the Board's institution decision in IPR2018-01436 involving the '552 patent, which included the Board's application of Sourcefire to a similar set of claims. Prelim. Resp. 26 (citing Ex. 1002, 1638–40; Pet. 6). Patent Owner

contends the Office considered and dismissed nearly identical arguments against the '193 patent in the petition filed in IPR2018-01559 and the later-filed *ex parte* reexamination request against the '193 patent. *Id.* Patent Owner argues that Petitioner has not demonstrated any material error in the Office's extensive prior considerations of Sourcefire. *Id.*

D. Discussion

1. Advanced Bionics Part 1

Turning to the first part of the *Advanced Bionics* framework, we consider whether the same or substantially the same art or arguments previously were presented to the Office. Sourcefire was submitted to the Office in an IDS during prosecution of the '343 patent. Ex. 1002, 1313. The Examiner acknowledged having considered Sourcefire by signing the IDS. *Id.* at 1406–1408. In addition, the '343 Patent lists Sourcefire as a cited reference. Ex. 1001, code (56) (listing Sourcefire on page 5). It is beyond dispute that Sourcefire was before the Office during prosecution of the '343 patent.

We next consider the cumulative nature of the asserted art and prior art evaluated during examination under *Becton, Dickinson*. Petitioner relies on the combination of Sourcefire and Mantripragada as teaching certain dependent claims of the '343 patent. Pet. 6. Although Mantripragada was not considered during prosecution of the '343 patent, Patent Owner contends that Buck (US 2002/0186683 A1, published Dec. 12, 2002), which was expressly considered by the Examiner, is cumulative to Mantripragada in

disclosing the blocking of UDP[3] (or RTP[4]) packet transfers by a firewall. Prelim. Resp. 31–32 (citing Ex. 1002, 1348–1349, 1569–1570; Ex. 2016 ¶¶ 9, 50, 56). After reviewing the evidence, we agree with Patent Owner's assessment that Mantripragada is cumulative to Buck, which the Examiner considered during prosecution.

We now consider under *Becton, Dickinson* the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art. Petitioner argues that the reason the Examiner allowed the claims of the '343 patent was a two-stage packet filtering process that the Examiner found missing from the prior art. Pet. 9, 23. Although some of the claim amendments during prosecution may have touched upon this feature, Patent Owner revised the claims in the amendment filed March 27, 2019, to recite that the packet transformation function is configured "to prevent an exfiltration operation" and argued in the amendment filed November 4, 2019, that this feature distinguished the claims over the combination of Ahn (US 2011/0055916 A1, published Mar. 3, 2011) and Stolfo (US 2012/0084866 A1, published Apr. 5, 2012). Ex. 1002, 1422, 1424, 1426–1429, 1613–1614. The Examiner then issued a notice of allowance specifically mentioning that the November 4, 2019, amendment overcame Stolfo. Ex. 1002, 1639. Hence, the record shows that the Examiner considered preventing an exfiltration operation pertinent to allowance of the claims. Patent Owner argues here that the challenged claims distinguish

[3] User Datagram Protocol.

[4] Real-time Transport Protocol.

over Petitioner's prior art for the same reason, so Patent Owner's arguments during prosecution overlap with those made in this proceeding. Prelim. Resp. 40–47. Petitioner has not shown that the Examiner allowed the claims because of the two-stage filtering process.

To summarize, we find that Sourcefire was considered by the Examiner during prosecution of the '343 patent and that Mantripragada is cumulative to Buck, which was considered during prosecution of the '343 patent. We further find that Patent Owner's argument during prosecution that the packet transformation function is configured "to prevent an exfiltration operation" resulted in allowance of the claims of the '343 patent, which overlaps with the argument that Patent Owner makes in this case against Petitioner's challenges. Prelim. Resp. 35–36. Petitioner has not shown that the two-stage filtering process was a basis for the Examiner's allowance of the claims of the '343 patent over the cited prior art. We, therefore, find that the same or substantially the same prior art, and the same or substantially the same arguments, previously were presented to the Office under the first part of the *Advanced Bionics* framework.

2. Advanced Bionics Part 2

Under the second part of the *Advanced Bionics* framework, we first consider the extent to which the asserted art was evaluated during examination. Although Sourcefire was not discussed in the prosecution history, it was considered by the Examiner in an IDS and is listed on the '343 patent. Ex. 1002, 1406–1408; Ex. 1001, code (56) (listing Sourcefire on page 5). Mantripragada is cumulative to Buck in the manner that the Examiner applied it for its teaching of blocking UDP (or RTP) packet transfers. Pet. 70–71 (citing Ex. 1007 ¶¶ 69–70); Ex. 1002, 1348–49,

1569–70; Ex. 2016 ¶¶ 9, 50, 56.

We now consider whether Petitioner has pointed out sufficiently how the Examiner erred when evaluating the asserted prior art under *Becton, Dickinson*. Petitioner contends that the Examiner erred by failing to understand and apply Sourcefire in a rejection instead of allowing the challenged claims of the '343 patent over Sourcefire's teaching of a two-stage packet filtering process. Pet. 8–10, 23. However, the Examiner allowed the claims because of the exfiltration operation. Ex. 1002, 1422. Petitioner has not shown that the two-stage filtering process was pertinent to the Examiner's allowance of the claims. Consequently, Petitioner has not identified sufficiently any material error on the part of the Examiner during prosecution of the '343 patent.

Petitioner argues that the Examiner erred by failing to discuss the Board's analysis of Sourcefire in IPR2018-01436 involving the '552 patent. Pet. 10. Petitioner further contends the Examiner's alleged error is confirmed by the Federal Circuit's determination that all challenged claims of the '552 patent were unpatentable over Sourcefire. Ex. 1042, 70; Ex. 1043.

We do not agree that the Examiner so erred. The evidence shows that the Examiner considered the filings from IPR2018-01436, including the '552 patent, petition, declaration, and institution decision, by signing the IDS forms. Ex. 1001, code (56) (pages 2, 5, 6); Ex. 1002, 1361, 1407, 1502, 1527, 1528, 1583. Although Petitioner cites various cases where prior art was cited in an IDS but was not deemed sufficiently considered by the Examiner (Pet. 9–11), that is not the case here where there was extensive history before the Examiner, the Board, and the Federal Circuit concerning

Sourcefire and its application to the '552 patent. In addition, the Examiner of the '343 patent also examined the '193 patent and was familiar with Sourcefire at least from IPR2018-01559 involving the '193 patent. IPR2018-01559, Ex. 1002, 292; Ex. 1002, 1634 (notice of allowances with Examiner's name). And, although there are similarities between the '552 patent's claims and those of the '343 patent, there are also material differences that Petitioner does not address. Ex. 1044; *see* Pet. 11–12. For example, the '343 patent's claims recite determination steps and applying the packet transformation function configured to prevent an exfiltration operation. Ex. 1044; Ex. 1001, 11:33–36, 11:45–50, 11:56–58. These features are not present in the '552 patent's claims, notwithstanding Petitioner's argument that the '343 patent's claims are broader than the '552 patent's claims. Pet. 12. Hence, we are not persuaded that the Examiner erred regarding the '552 patent or filings from the *inter partes* review in which it was challenged.

Furthermore, Sourcefire was considered extensively in the reexamination of the '193 patent, and one of the reasons the claims were confirmed was because they recite, in essence, prevention of exfiltration. Ex. 2010, 595–596, 604–605. Hence, the Examiner's allowance of the '343 patent claims, which explicitly recite preventing exfiltration, was consistent with the Office's confirmation of the '193 patent claims during reexamination.

The last consideration in the *Becton, Dickinson* framework is the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments. Petitioner's declarant testifies regarding the prosecution history of the '343 patent. Ex. 1003

¶¶ 85–90. He concludes that "the '343 Patent claims were apparently allowed because the Examiner concluded that the prior art of record failed to disclose a two-stage packet filtering process," mirroring Petitioner's argument. *Id.* ¶ 90. Petitioner's declarant does not indicate how the facts support this conclusion. As mentioned, Patent Owner's argument during prosecution leading to allowance was that the '343 patent's claims recite applying the packet transformation function configured to prevent an exfiltration operation. Ex. 1002, 1614–1615, 1639. Petitioner's declarant does not explain sufficiently where in the prosecution history Patent Owner argued that a two-stage packet filtering process distinguished the '343 patent's claims over the prior art, or where the Examiner allowed the claims because of two-stage packet filtering. Accordingly, lacking evidentiary support, the declarant's testimony is entitled to little or no weight on this point. 37 C.F.R. § 42.65(a). Thus, we see no additional evidence or facts in the Petition that warrant reconsideration of the prior art. Therefore, we find that Petitioner has not demonstrated that the Office erred in a manner material to the patentability of the challenged claims under the second part of the *Advanced Bionics* framework.

IV. CONCLUSION

As discussed above, Petitioner's challenges to the '343 patent's claims rely on Sourcefire and Mantripragada. Sourcefire was considered by the Examiner during prosecution of the '343 patent. Although Mantripragada was not cited during prosecution, it is cumulative with Buck, a reference which the Examiner did consider and used in rejections during prosecution of the '343 patent. Patent Owner overcame the Examiner's rejections with

amendments and arguments. Petitioner has not shown that the Examiner erred in considering Sourcefire or Buck, cumulative with Mantripragada, during prosecution of the '343 patent. Given these facts, we exercise our discretion to deny institution of *inter partes* review.

V. ORDER

It is ORDERED that the Petition for *inter partes* review is *denied.*

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UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/614,956	02/18/2020	10567343	007742.00091\US	9334

22907 7590 01/29/2020

BANNER & WITCOFF, LTD.
1100 13th STREET, N.W.
SUITE 1200
WASHINGTON, DC 20005-4051

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Sean Moore, Hollis, NH;
Centripetal Networks, Inc., Herndon, VA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PART B–FEE(S) TRANSMITTAL

Complete and send this form, together with the applicable fee(s), by mail or fax, or via EFS-Web.

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Washington, DC 20005

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
15/614,956	06/06/2017	Sean Moore	007742.00091\US	9334

TITLE OF INVENTION: FILTERING NETWORK DATA TRANSFERS

APPLN: TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500.00			$500.00	03/12/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
A. N. M. Nguyen	2473	370-392

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363)

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. Banner & Witcoff, Ltd.
2.
3.

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Centripetal Networks, Inc.

(B) RESIDENCE: (CITY and STATE or COUNTRY): Portsmouth, New Hampshire

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees Submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

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☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 19-0733

5. Change of Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29. NOTE: Absent a valid Certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27. NOTE: If the application was previously under micro entity status, checking this box will be taken as a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status. NOTE: Checking this box will be taken as a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature: /Christian LaForgia/ Date: January 6, 2020

Typed or printed name: Christian LaForgia Registration No. 71,227

Electronic Patent Application Fee Transmittal

Application Number:	15614956
Filing Date:	06-Jun-2017
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Filer:	Christian A. LaForgia/Victoria van de Veerdonk
Attorney Docket Number:	007742.00091\US

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**500**

Electronic Acknowledgement Receipt

EFS ID:	38205776
Application Number:	15614956
International Application Number:	
Confirmation Number:	9334
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Customer Number:	22907
Filer:	Christian A. LaForgia/Victoria van de Veerdonk
Filer Authorized By:	Christian A. LaForgia
Attorney Docket Number:	007742.00091\US
Receipt Date:	06-JAN-2020
Filing Date:	06-JUN-2017
Time Stamp:	09:51:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$500
RAM confirmation Number	E202016052105140
Deposit Account	190733
Authorized User	Victoria van de Veerdonk

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37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	PART_B_20220266.pdf	37230 fa770137005af91404f2769276268c5d876f1b13	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30404 aae3ecf533daaa5f6e2f90e67fd7c353a46d78c1	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	67634		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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NOTICE OF ALLOWANCE AND FEE(S) DUE

22907 7590 12/12/2019
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SUITE 1200
WASHINGTON, DC 20005-4051

EXAMINER
NGUYEN, ANH NGOC M

ART UNIT	PAPER NUMBER
2473	

DATE MAILED: 12/12/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/614,956	06/06/2017	Sean Moore	007742.00091\US	9334

TITLE OF INVENTION: FILTERING NETWORK DATA TRANSFERS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	03/12/2020

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

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III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

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(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/614,956	06/06/2017	Sean Moore	007742.00091\US	9334

TITLE OF INVENTION: FILTERING NETWORK DATA TRANSFERS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	03/12/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, ANH NGOC M	2473	370-392000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

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3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

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5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/614,956	06/06/2017	Sean Moore	007742.00091\US	9334

22907 7590 12/12/2019

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EXAMINER	
NGUYEN, ANH NGOC M	
ART UNIT	PAPER NUMBER
2473	

DATE MAILED: 12/12/2019

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 15/614,956	Applicant(s) Moore, Sean	
	Examiner Anh Ngoc M Nguyen	Art Unit 2473	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to 11/04/2019.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-20 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 11/05/2019.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/ANH NGOC M NGUYEN/
Primary Examiner, Art Unit 2473

REASONS FOR ALLOWANCE

1. Claims 1 – 20 are allowed.

2. The following is an examiner's statement of reasons for allowance:

Applicant's Arguments/Remarks and amendments filed November 4, 2019 with respect to independent claims 1, 8 and 15 have been considered and they are persuasive.

Plus, the prior art rejection under Stolfl (US Pub. No. 2012/0084866) and the rejection under 35 U.S.C. 112, first paragraph, are withdrawn.

Claim 1 has been amended to overcome the claim objections.

Examiner believes that the record of the prosecution as a whole does make clear the reasons for allowing claims 1 - 20. Please refer to record of prosecution.

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh Ngoc M Nguyen whose telephone number is (571)270-5139. The examiner can normally be reached on M-F 7:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Bin Yao can be reached on (571)272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is

encouraged to use the USPTO Automated Interview Request (AIR) at

http://www.uspto.gov/interviewpractice .

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ANH NGOC M NGUYEN/
Primary Examiner, Art Unit 2473

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/614,956	Moore, Sean
	Examiner	Art Unit
	Anh Ngoc M Nguyen	2473

CPC - Searched*		
Symbol	Date	Examiner
h04l45/74, 745 h04l63/0254, 0236, 0263, 1466 h04l67/02 h04l69/22 -- see search history	12/02/2019	AN

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
searched for double patenting; inventors; assignee; EAST database, subgroups combined with texts search for invention	12/02/2019	AN

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	h04l63/0254	12/02/2019	AN

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/614,956	Moore, Sean
	Examiner	**Art Unit**
	Anh Ngoc M Nguyen	2473

CPC						
Symbol					**Type**	**Version**
H04L	/	63	/	0254	F	2013-01-01
H04L	/	63	/	0263	I	2013-01-01
H04L	/	63	/	1466	I	2013-01-01
H04L	/	67	/	02	I	2013-01-01
H04L	/	45	/	74	I	2013-01-01
H04L	/	69	/	22	I	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	20	
/ANH NGOC M NGUYEN/ Primary Examiner, Art Unit 2473	02 December 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

U.S. Patent and Trademark Office

Part of Paper No.: 20191202

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/614,956	Moore, Sean
	Examiner	**Art Unit**
	Anh Ngoc M Nguyen	2473

INTERNATIONAL CLASSIFICATION					
CLAIMED					
H04L29/06	/	29	/	06	

NON-CLAIMED					
	/		/		

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/ANH NGOC M NGUYEN/ Primary Examiner, Art Unit 2473	02 December 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/614,956	Moore, Sean
	Examiner	**Art Unit**
	Anh Ngoc M Nguyen	2473

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/ANH NGOC M NGUYEN/ Primary Examiner, Art Unit 2473	02 December 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/614,956	Moore, Sean
	Examiner	**Art Unit**
	Anh Ngoc M Nguyen	2473

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/24/2018	05/24/2019	12/02/2019						
	1	✓	✓	=						
	2	✓	✓	=						
	3	✓	✓	=						
	4	✓	✓	=						
	5	✓	✓	=						
	6	✓	✓	=						
	7	✓	✓	=						
	8	✓	✓	=						
	9	✓	✓	=						
	10	✓	✓	=						
	11	✓	✓	=						
	12	✓	✓	=						
	13	✓	✓	=						
	14	✓	✓	=						
	15	✓	✓	=						
	16	✓	✓	=						
	17	✓	✓	=						
	18	✓	✓	=						
	19	✓	✓	=						
	20	✓	✓	=						

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15614956
Filing Date	2017-06-06
First Named Inventor	Sean Moore
Art Unit	2473
Examiner Name	A. N. M. Nguyen
Attorney Docket Number	007742.00091\US

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6907042	B1	2005-06-14	Oguchi	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050076227	A1	2005-04-07	Kang et al.	
	2	20040148520	A1	2004-07-29	Talpade et al.	
	3	20090150972	A1	2009-06-11	MOON et al.	
	4	20090262723	A1	2009-10-22	Pelletier et al.	
	5	20030014665	A1	2003-01-16	Anderson et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	6	20170272469	A1	2017-09-21	Kraemer et al.	
	7	20090300759	A1	2009-12-03	Wang et al.	
	8	20120240185	A1	2012-09-20	Kapoor et al.	
	9	20110214157	A1	2011-09-01	Korsunsky et al.	
	10	20150347246	A1	2015-12-03	MATSUI et al.	
	11	20120110656	A1	2012-05-03	Santos et al.	
	12	20090144819	A1	2009-06-04	BABBAR et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Attorney Docket Number	007742.00091\US

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	2019 Mar 18 (AU) First Examination Report - App. 2016379156 (007742.00117)	
	2	2019 Apr 8 (US) Final Office Action - App. 15/413,947 (007742.00086)	
	3	2018 Aug 10 (US) Declaration of Kevin Jeffay, PhD in Support of Fourth Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01506	
	4	2018 Aug 10 (US) Fourth Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01506	
	5	2018 Aug 03 (US) Third Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01505	
	6	2018 Aug 03 (US) Declaration of Kevin Jeffay, PhD in Support of Third Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01505	
	7	2018 Aug 03 (US) Declaration of Kevin Jeffay, PhD in Support of Third Petition for Inter Partes Review of U.S. Patent No. 9,560,077 - IPR2018-01513	
	8	2019 Apr 2 (US) Decision - Institution of Inter Partes Review of U.S. Patent 9,560,077 - IPR 2018-01513	
	9	2018 Aug 10 (US) Petition for Inter Partes Review of Claims 1-20 of U.S. Patent No. 9,560,077 - IPR2018-01515	
	10	2019 May 23 (US) Non-Final Office Action - App. 14/745,207 (007742.00049)	

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	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	11	2019 May 24 (US) Non-Final Office Action - App. 16/111,524 (007742.00123)
	12	2019 Jun 3 (EP) Communication pursuant to Article 94(3) EPC - Third Examination Report - App. 13765547.8 (007742.00044)
	13	2018 Aug 2 (US) Notice of Allowance and Fees Due - App. ~~16/030,254~~ 16/030,354 (007742.00114)
	14	2019 Jul 5 (EP) Extended European Search Report - App. 19179539.2 (007742.00141)
	15	2019 Aug 2 (CA) Office Action - App. 2,888,935 (007742.00046)
	16	2019 Aug 2 (US) Non-Final Office Action - App. 16/448,969 (007742.00143)
	17	2019 Aug 16 (EP) Extended Search Report - App. 19170936.9 (007742.00140)
	18	2018 Sep 18 (US) Petition for Inter Partes Review of U.S. Patent No. 9,413,722 - IPR 2018-01760
	19	2018 Sep 18 (US) Declaration of Dr. Stuart Staniford in Support of Petition for Inter Partes Review of U.S. Patent No. 9,413,722 - IPR 2018-01760
	20	2019 Sept 3 (US) Notice of Allowance and Fees Due - App. 16/518,190 (007742.00147)
	21	2019 Aug 19 (EP) Communication pursuant to Article 94(3) EPC - Examination Report - App. 14719415.3 (007742.00053)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	22	2019 Oct 10 - (US) Notice of Allowance - App 16/448,997
	23	2019 Oct 11 - (US) Non-Final Office Action - App 16/554,293

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/ANH NGOC M NGUYEN/	Date Considered	12/02/2019

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15614956
Filing Date	2017-06-06
First Named Inventor	Sean Moore
Art Unit	2473
Examiner Name	A. N. M. Nguyen
Attorney Docket Number	007742.00091\US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Christian LaForgia/	Date (YYYY-MM-DD)	2019-11-04
Name/Print	Christian LaForgia	Registration Number	71,227

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.N/

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

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8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.N/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2	"15614956"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 07:25
L2	20	((("Centripetal") near3 ("Networks") near3 ("Inc"))).AS,AANM.	USPAT	OR	ON	2019/12/02 07:25
L3	155	((("Moore") near3 ("Sean"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/02 07:25
L4	13	("20030014665" | "20040148520" | "20050076227" | "20090144819" | "20090150972" | "20090262723" | "20090300759" | "20110214157" | "20120110656" | "20120240185" | "20150347246" | "20170272469" | "6907042").PN.	US-PGPUB; USPAT	OR	ON	2019/12/02 07:26
L5	68	(app application$1) near4 header$1 same (prevent$4 avoid$3 eliminat$4 block$3) near4 (threat$1 intruder$1 malicious extrusion exfiltration attack$3 steal$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:14
L6	215	((app application$1) near4 header$1 same rule$1) and ((prevent$4 avoid$3 eliminat$4 block$3) near4 (threat$1 intruder$1 malicious extrusion exfiltration attack$3 steal$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:30
L7	12076	h04l45/74.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:30
L8	10076	h04l45/745.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:30
L9	8	6 and 7	US-PGPUB; USPAT; USOCR;	OR	ON	2019/12/02 08:30

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
L10	3	6 and 8	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:30
L11	2255	h04l63/0254.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:44
L12	9203	h04l63/0236.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:44
L13	10	6 and 11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:44
L14	11	6 and 12	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:44
L15	8234	h04l63/0263.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:53
L16	8256	h04l63/1466.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:53
L17	55	6 and 15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 08:53
L18	12	6 and 16	US-PGPUB;	OR	ON	2019/12/02

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			08:53
L19	93825	h04l67/02.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:19
L20	36	6 and 19	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:19
L21	36521	h04l69/22.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:23
L22	36	6 and 21	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:23
L23	93	(app application$1) near4 header$1 with (filter$3 rule$1) same (prevent$4 avoid$3 eliminat$4 block$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:24
L24	9	23 and 7	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:24
L25	8	23 and 8	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:24
L26	9	23 and 11	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2019/12/02 09:29

			IBM_TDB			
L27	4	23 and 12	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:29
L28	15	23 and 15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:33
L29	9	23 and 16	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:33
L30	12	23 and 19	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:38
L31	20	23 and 21	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:38
L32	41	(app application$1) near4 header$1 same (filter$3 rule$1) with (threat$1 intruder$1 malicious extrusion exfiltration attack$3 steal$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:38
L33	3	(app application$1) near4 header$1 same (criterion$1 criteria operator$1) with (threat$1 intruder$1 malicious extrusion exfiltration attack$3 steal$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:49
L34	6	(app application$1) near4 header$1 same (criterion$1 criteria operator$1) same (threat$1 intruder$1 malicious extrusion exfiltration attack$3 steal$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/02 09:50

EAST Search History (Interference)

Ref	Hits	Search Query	DBs	Default	Plurals	Time

#				Operator		Stamp
L35	415	h04l63/0254.cpc.	USPAT	OR	ON	2019/12/02 10:20
L38	0	(((app application$1) near4 header$1 same (rule$1 filter$3 criterion$1 criteria operator$1)) and ((prevent$4 avoid$3 eliminat$4 block$3) and (threat$1 intruder$1 malicious extrusion exfiltration attack$3 steal$3))).clm.	USPAT	OR	ON	2019/12/02 10:22
L39	1	(((app application$1) near4 header$1 and (rule$1 filter$3 criterion$1 criteria operator$1)) and ((prevent$4 avoid$3 eliminat$4 block$3) and (threat$1 intruder$1 malicious extrusion exfiltration attack$3 steal$3))).clm.	USPAT	OR	ON	2019/12/02 10:22
L40	11	((app application$1) near4 header$1 and ((prevent$4 avoid$3 eliminat$4 block$3) and (threat$1 intruder$1 malicious extrusion exfiltration attack$3 steal$3))).clm.	USPAT	OR	ON	2019/12/02 10:22
L41	1	35 and 40	USPAT	OR	ON	2019/12/02 10:23
L42	2	(((app application$1) near4 header$1 same (rule$1 filter$3 criterion$1 criteria operator$1)) and (threat$1 intruder$1 malicious extrusion exfiltration attack$3 steal$3)).clm.	USPAT	OR	ON	2019/12/02 10:23

12/ 2/ 2019 10:24:35 AM
C:\ Users\ anguyen4\ Documents\ EAST\ Workspaces\ 15614956.wsp

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/614,956	Filing Date 06/06/2017	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	* 0		x $40 =	0
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	* 0		x $210 =	0
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	0

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $0 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $0 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/PEGGY S YARBOROUGH/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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15614956	11/04/2019

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I2019A8B06498506	2801	RCE- 1ST REQUEST	$650.00	Deposit Account

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15614956
Filing Date	2017-06-06
First Named Inventor	Sean Moore
Art Unit	2473
Examiner Name	A. N. M. Nguyen
Attorney Docket Number	007742.00091\US

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6907042	B1	2005-06-14	Oguchi	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050076227	A1	2005-04-07	Kang et al.	
	2	20040148520	A1	2004-07-29	Talpade et al.	
	3	20090150972	A1	2009-06-11	MOON et al.	
	4	20090262723	A1	2009-10-22	Pelletier et al.	
	5	20030014665	A1	2003-01-16	Anderson et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	6	20170272469	A1	2017-09-21	Kraemer et al.	
	7	20090300759	A1	2009-12-03	Wang et al.	
	8	20120240185	A1	2012-09-20	Kapoor et al.	
	9	20110214157	A1	2011-09-01	Korsunsky et al.	
	10	20150347246	A1	2015-12-03	MATSUI et al.	
	11	20120110656	A1	2012-05-03	Santos et al.	
	12	20090144819	A1	2009-06-04	BABBAR et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	2019 Mar 18 (AU) First Examination Report - App. 2016379156 (007742.00117)	
	2	2019 Apr 8 (US) Final Office Action - App. 15/413,947 (007742.00086)	
	3	2018 Aug 10 (US) Declaration of Kevin Jeffay, PhD in Support of Fourth Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01506	
	4	2018 Aug 10 (US) Fourth Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01506	
	5	2018 Aug 03 (US) Third Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01505	
	6	2018 Aug 03 (US) Declaration of Kevin Jeffay, PhD in Support of Third Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01505	
	7	2018 Aug 03 (US) Declaration of Kevin Jeffay, PhD in Support of Third Petition for Inter Partes Review of U.S. Patent No. 9,560,077 - IPR2018-01513	
	8	2019 Apr 2 (US) Decision - Institution of Inter Partes Review of U.S. Patent 9,560,077 - IPR 2018-01513	
	9	2018 Aug 10 (US) Petition for Inter Partes Review of Claims 1-20 of U.S. Patent No. 9,560,077 - IPR2018-01515	
	10	2019 May 23 (US) Non-Final Office Action - App. 14/745,207 (007742.00049)	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	11	2019 May 24 (US) Non-Final Office Action - App. 16/111,524 (007742.00123)
	12	2019 Jun 3 (EP) Communication pursuant to Article 94(3) EPC - Third Examination Report - App. 13765547.8 (007742.00044)
	13	2018 Aug 2 (US) Notice of Allowance and Fees Due - App. 16/030,254 (007742.00114)
	14	2019 Jul 5 (EP) Extended European Search Report - App. 19179539.2 (007742.00141)
	15	2019 Aug 2 (CA) Office Action - App. 2,888,935 (007742.00046)
	16	2019 Aug 2 (US) Non-Final Office Action - App. 16/448,969 (007742.00143)
	17	2019 Aug 16 (EP) Extended Search Report - App. 19170936.9 (007742.00140)
	18	2018 Sep 18 (US) Petition for Inter Partes Review of U.S. Patent No. 9,413,722 - IPR 2018-01760
	19	2018 Sep 18 (US) Declaration of Dr. Stuart Staniford in Support of Petition for Inter Partes Review of U.S. Patent No. 9,413,722 - IPR 2018-01760
	20	2019 Sept 3 (US) Notice of Allowance and Fees Due - App. 16/518,190 (007742.00147)
	21	2019 Aug 19 (EP) Communication pursuant to Article 94(3) EPC - Examination Report - App. 14719415.3 (007742.00053)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	22	2019 Oct 10 - (US) Notice of Allowance - App 16/448,997
	23	2019 Oct 11 - (US) Non-Final Office Action - App 16/554,293

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Christian LaForgia/	Date (YYYY-MM-DD)	2019-11-04
Name/Print	Christian LaForgia	Registration Number	71,227

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	37654874
Application Number:	15614956
International Application Number:	
Confirmation Number:	9334
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Customer Number:	22907
Filer:	Christian A. LaForgia/Michelle Reed
Filer Authorized By:	Christian A. LaForgia
Attorney Docket Number:	007742.00091\US
Receipt Date:	05-NOV-2019
Filing Date:	06-JUN-2017
Time Stamp:	10:03:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	Information_Disclosure_Statement_Fillable_PDF_20035381.pdf	1035509 4626242ce384f545070b6d88f39a7e38c6070e94	no	7

Warnings:

Information:					
2	Non Patent Literature	First_Examination_Report_dtd_03-18-2019_19681764.PDF	215628 96412ce37c45c82218e738fd4d716d28778e7942	no	5
Warnings:					
Information:					
3	Non Patent Literature	Final_Rejection__1449_19700306.pdf	1816695 69ccae9a86875b4cd3c73b1956c755528a57874c	no	44
Warnings:					
Information:					
4	Non Patent Literature	IPR2018-01506_Declaration_of_Kevin_Jeffay_19745035.PDF	4642115 c53c8dcfacd3683b309f889476841e75c1780367	no	205
Warnings:					
Information:					
5	Non Patent Literature	2018_08_10_Fourth_Petition_for_Review_-_US_Pat_No_9137205_19745106.PDF	1701216 b496a318088aae63e1dfc77e744254faf1b4be92	no	94
Warnings:					
Information:					
6	Non Patent Literature	2018_Aug_3_Third_Petition_for_Review_-_IPR2018-01505_-_US_Patent_No_9137205_19745114.PDF	1387016 5f4290ab53129dbbcae94674c2da14667a5be455	no	87
Warnings:					
Information:					
7	Non Patent Literature	Declaration_of_Jeffay_in_Support_of_Third_Petition_-_IPR2018-01505_19745123.PDF	7071093 bd98e12a5467ae104b70dde365f6546e48410338	no	191
Warnings:					
Information:					
8	Non Patent Literature	Delcaration_of_Jeffay_in_Support_of_Petition_-_IPR2018-01513_19745131.PDF	4007891 be19344c67ac351b07c1fc1b034943735943dac0	no	184
Warnings:					
Information:					

9	Non Patent Literature	IPR2018-01513_Decision_on_Institution_19745142.PDF	449046 021ae74b905142f166098ba7e816e7de67eef353	no	27
Warnings:					
Information:					
10	Non Patent Literature	2018_Aug_10_Petition_for_Review_-_IPR2018-01513_-_US_Pat_No_9560077_19745153.PDF	1174653 4dc50b4af1716b8ad0e7401954dcc988d404651e	no	86
Warnings:					
Information:					
11	Non Patent Literature	Non-Final_Rejection__1449_19783793.pdf	1701443 b34f53bd3403e8523c1dbd714cf7db03e7e92c10	no	43
Warnings:					
Information:					
12	Non Patent Literature	Non-Final_Rejection__892__1449_19786008.pdf	3609830 f61e108ff3b2906053e61557371905d3346bcdac	no	91
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13	Non Patent Literature	03_Jun_2019_EP_Third_Examination_Report_13765547_19836161.PDF	447608 7809730cb6ae6efa98ff8fb67faacc60a73077c8	no	11
Warnings:					
Information:					
14	Non Patent Literature	Notice_of_Allowance_and_Fees_Due_PTOL-85__INTVSUMEX__OAAPPENDIX__892_19912108.pdf	1009943 6901de28af39ffed35822411db2575432a704112	no	23
Warnings:					
Information:					
15	Non Patent Literature	2019_Jul_5_EP_Extended_Srch_Rpt_19179539_19883105.PDF	332378 51cf770dc282d29939e085b5fc2e99f7ebf2b047	no	9
Warnings:					
Information:					

16	Non Patent Literature	CIPO_OA_dtd_08-02-2019_19926836.PDF	312757 c0f646feec670d9f17e3824a73036d5782c68152	no	6
Warnings:					
Information:					
17	Non Patent Literature	Non-Final_Rejection__892__14492_19912157.pdf	3300675 40ae71447dfc2966c06d441b94e208d45b092381	no	114
Warnings:					
Information:					
18	Other Reference-Patent/App/Search documents	2019_Aug_16_EP_Extended_Srch_Rpt__WO_19972746.PDF	494264 f37480623716df258a26b2680560b91fe8ba3b30	no	7
Warnings:					
Information:					
19	Non Patent Literature	IPR_Petition_filed_09-18-2019_IPR2018-01760_19972995.pdf	3342875 6edfe0d75a24d35e3965186a1ba77c5b420b7b68	no	97
Warnings:					
Information:					
20	Non Patent Literature	Declaration_of_Dr_Stanford_in_Support_of_IPR_Petition_filed_09-18-2019_IPR2018-017_19973013.pdf	4851792 1183764bce8f1adad8953db7a5664bd01d6546be	no	117
Warnings:					
Information:					
21	Non Patent Literature	Notice_of_Allowance_and_Fees_Due_PTOL-85__892__1449_19978951.pdf	1780598 cee5ca9bda0b28bde5d17c7aef9ef3d43a588c8e	no	55
Warnings:					
Information:					
22	Non Patent Literature	2019_Aug_19_EP_Examination_Report_App_14718415_3_20021089.PDF	186271 c335a4719216d49377c8df3f1f9cf6304694238c	no	6
Warnings:					
Information:					

23	Non Patent Literature	Notice_of_Allowance_and_Fees_Due_PTOL-85pdf_00774200144_20105644.PDF	422319 0a195c12226dbcf8f003c1d0c771c1e4dd2256a2	no	7
Warnings:					
Information:					
24	Non Patent Literature	Non-Final_Rejection__892__1449pdf_00774200149_20105647.PDF	2843984 fc22917897efa396c586d0d56b5dea44fcc3633f	no	96
Warnings:					
Information:					
		Total Files Size (in bytes):	48137599		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	15614956	Filing Date	2017-06-06	Docket Number (if applicable)	007742.00091\US	Art Unit	2473
First Named Inventor	Sean Moore			Examiner Name	A. N. M. Nguyen		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 19-0733

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (02-18)
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Signature of Registered U.S. Patent Practitioner			
Signature	/Christian LaForgia/	Date (YYYY-MM-DD)	2019-11-04
Name	Christian LaForgia	Registration Number	71227

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Docket No.: 007742.00091\US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Sean Moore

Application No.: 15/614,956 Confirmation No.: 9334

Filed: June 6, 2017 Art Unit: 2473

For: FILTERING NETWORK DATA TRANSFERS Examiner: A. N. M. Nguyen

AMENDMENT AND

REQUEST FOR CONTINUED EXAMINATION ("RCE") UNDER 37 C.F.R. § 1.114

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

In response to the Final Office Action dated June 3, 2019, and in conjunction with the RCE filed concurrently herewith, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 9 of this paper.

Applicant requests any necessary extension of time for the submission of this paper. If any fees are required or if an overpayment is made, the Commissioner is authorized to debit or credit our Deposit Account No. 19-0733, accordingly.

AMENDMENTS TO THE CLAIMS

This Listing of Claims will replace all prior versions and listings of claims in this application.

1. (Currently Amended) A method comprising:

receiving, by a computing system comprising memory and at least one processor, a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets~~, wherein the second portion of packets is a portion of the first portion of packets~~;

determining, based on a packet header field value, whether each packet of the plurality of packets comprises data corresponding to first criterion specified by one or more packet-filtering rules;

responsive to a determination by the computing system that a packet header field value of the first portion of packets comprises data corresponding to the first criterion specified by at least one matching packet-filtering rule, applying, by the computing system and to each packet in the first portion of packets, one or more operators specified by the at least one matching packet-filtering rule;

determining, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule; and

responsive to determining the second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, applying, by the computing system and to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to ~~an prevent exfiltration~~ prevent an exfiltration operation, wherein the at least one packet transformation function indicates whether each packet in the second portion of packets is allowed to continue toward its destination.

2. (Previously Presented) The method of claim 1, wherein:

the first portion of packets comprises a packet header field value indicating a protocol type associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule.

3. (Previously Presented) The method of claim 1, wherein:

the first portion of packets comprises data indicating a destination port number associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule.

4. (Previously Presented) The method of claim 1, wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets, and wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, the method further comprising:

allowing each packet of the third portion of packets to continue toward its respective destination; and

blocking each packet of the fourth portion of packets from continuing toward its respective destination.

5. (Previously Presented) The method of claim 1, the method further comprising:

allowing, based on a determination that the application header field value indicates a request for specified resource data, each packet of the second portion of packets indicating a request for specified resource data to continue toward its respective destination; and

blocking, based on a determination that the application header field value indicates a request to submit data to be processed by a specified resource, each packet of the second portion of packets indicating a request to submit data to be processed by the specified resource from continuing toward its respective destination.

6. (Previously Presented) The method of claim 1, further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular transport layer security (TLS) version value.

7. (Previously Presented) The method of claim 1, further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular real-time transport protocol value.

8. (Currently Amended) An apparatus comprising:

at least one processor; and

memory storing instructions that, when executed by the at least one processor, cause the apparatus to:

receive a plurality of packets~~, wherein the plurality of packets comprises a first portion of packets and a second portion of packets, wherein the second portion of packets is a portion of the first portion of packets~~;

determine, based on a packet header field value, whether the plurality of packets comprises data corresponding to first criterion specified by one or more packet-filtering rules;

responsive to a determination that a packet header field value of ~~the~~ a first portion of packets comprises data corresponding to the first criterion specified by at least one matching packet-filtering rule, apply, to each packet in the first portion of packets, one or more operators specified by the at least one matching packet-filtering rule;

determine, based on an application header field value, ~~the~~ a second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule; and

responsive to determining the second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the

at least one matching packet-filtering rule, apply, to each packet in the second portion of packets, at least one packet transformation function configured to prevent an exfiltration operation, wherein the at least one packet transformation function indicates whether each packet in the second portion of packets is allowed to continue toward its destination.

9. (Previously Presented) The apparatus of claim 8, wherein

the first portion of packets comprises a packet header field value indicating a protocol type associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule.

10. (Previously Presented) The apparatus of claim 8, wherein:

the first portion of packets comprises data indicating a destination port number associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule.

11. (Previously Presented) The apparatus of claim 8, wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets, and wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the at least one processor cause the apparatus to:

allow each packet of the third portion of packets to continue toward its respective destination; and

block each packet of the fourth portion of packets from continuing toward its respective destination.

12. (Previously Presented) The apparatus of claim 8, wherein the instructions, when executed by the one or more computing devices, cause the apparatus to:

allow, based on a determination that the application header field value indicates a request for data from a specified resource, each packet of the second portion of packets indicating a request for data from a specified resource to continue toward its respective destination; and

block, based on a determination that the application header field value indicates a request to submit data to be processed by a specified resource, each packet of the second portion of packets indicating a request to submit data to be processed by a specified from continuing toward its respective destination.

13. (Previously Presented) The apparatus of claim 8, wherein the instructions, when executed by the one or more computing devices, cause the apparatus to drop packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular transport layer security (TLS) version value.

14. (Previously Presented) The apparatus of claim 8, wherein the instructions, when executed by the one or more computing devices, cause the apparatus to drop packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular real-time transport protocol value.

15. (Currently Amended) One or more non-transitory computer-readable media comprising instructions that, when executed by one or more computing devices, cause the one or more computing devices to:

receive a plurality of packets~~, wherein the plurality of packets comprises a first portion of packets and a second portion of packets, wherein the second portion of packets is a portion of the first portion of packets~~;

determine, based on a packet header field value, whether the plurality of packets comprises data corresponding to first criterion specified by one or more packet-filtering rules;

responsive to a determination that a packet header field value of ~~the~~ a first portion of packets comprises data corresponding to the first criterion specified by at least one matching

packet-filtering rule, apply, to each packet in the first portion of packets, one or more operators specified by the at least one matching packet-filtering rule;

determine, based on an application header field value, ~~the~~ a second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule; and

responsive to determining the second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, apply, to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to prevent an exfiltration operation, wherein the at least one packet transformation function indicates whether each packet in the second portion of packets is allowed to continue toward its destination.

16. (Previously Presented) The one or more non-transitory computer-readable media of claim 15, wherein:

the first portion of packets comprises a packet header field value indicating a protocol type associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule.

17. (Previously Presented) The one or more non-transitory computer-readable media of claim 15, wherein:

the first portion of packets comprises data indicating a destination port number associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule.

18. (Previously Presented) The one or more non-transitory computer-readable media of claim 15, wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets, and wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions,

when executed by the one or more computing devices, cause the one or more computing devices to:

allow each packet of the third portion of packets to continue toward its respective destination; and

block each packet of the fourth portion of packets from continuing toward its respective destination.

19. (Previously Presented) The one or more non-transitory computer-readable media of claim 15, further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprises data corresponding to a particular transport layer security (TLS) version value.

20. (Previously Presented) The one or more non-transitory computer-readable media of claim 15, further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprises data corresponding to a particular real-time transport protocol value.

REMARKS

This communication is responsive to the Final Office Action ("Office Action" or "OA") mailed on June 3, 2019. A Request for Continued Examination ("RCE") under 37 C.F.R. § 1.114 and a two-month extension of time are filed concurrently herewith.

In the Office Action, claims 1-20 were rejected. By this communication, claims 1, 8, and 15 have been amended. No claims have been cancelled. Applicant submits that no new matter has been added. Thus, claims 1-20 thus remain pending for consideration.

Applicant respectfully requests reconsideration and allowance of claims 1-20 in view of the foregoing amendments and the following remarks.

Claim Objections

Claim 1 stands objected to for minor informalities. (OA at p.4.) In particular, claim 1 is objected to for reciting "an prevent exfiltration operation." (*Id.*) The Office Action recommended amending claim 1 to recite "~~an~~ prevent an exfiltration operation." (*Id.*)

Applicant appreciates the recommendation provided in the Office Action and has amended claim 1 accordingly. Therefore, Applicant submits that the objection to claim 1 is moot and respectfully requests that the objection be withdrawn.

Rejections Under 35 U.S.C. § 112

Claims 1, 8, and 15 stand rejected under pre-AIA 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement. (OA at pp. 2-3.) In particular, the Office Action states that "wherein the second portion of packets is a portion of the first portion of packets; and determining, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule" was not described in the specification in such a way as to reasonably convey to one of ordinary skill in the art that the inventors were in possession of the claimed invention at the time the application was filed. (OA at p. 3.) The Office Action explains that "Figure 4 only describes packets may be received, a determination may be made as to whether a portion of the received packets have packet header field values corresponding to a packet filtering rule, and a determination may be made as to whether one or more of the portion of the received packets have application header field values corresponding to

one or more application header field criteria." (OA at p. 3.) Applicant respectfully disagrees and submits that the lack of written description rejection of independent claims 1, 8, and 15 is improper.

The Office is respectfully reminded that the relevant inquiry for determining whether claims comply with the written description requirement is whether the specification conveys with reasonable clarity to one of ordinary skill in art that the Applicant was in possession of the invention as claimed at the time the application was filed. *See Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991). Possession of the invention is shown by "descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention." *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997). "Although the exact terms need not be used *in haec verba*[,] the specification must contain an equivalent description of the claimed subject matter." (Id. (internal citations omitted).) *See also* MPEP § 2163.02 ("The subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement.").

In this regard, the Office Action correctly points to Figure 4, and its corresponding written description at paragraphs [0056] and [0057], as being relevant to the elements at issue. (OA at p. 3.) In particular, the Office Action emphasizes that, "[a]t step 400, packets may be received." (OA at p. 3 (emphasis in original).) The Office Action next notes that "[a]t step 402, a determination may be made as to whether a portion of the received packets have packet header field values corresponding to a packet filtering rule. For example, a determination may be made as to whether a portion of the packets received from network 104 have packet header field values . . . corresponding to rule 5 310." (OA at p.3 (emphasis in the original).) The Office Action states that "[a]t step 460, a determination may be made as to whether one or more application header field values of **one or more of the portion of the received packets** correspond to one or more application header field criteria specified by the operator. For example, a determination may be made as to whether one or more of the portion of the received packets have application header field values corresponding to one or more application header field criteria specified by the operation, a packet transformation function specified by the operator may be applied to the one or more of the portion of the received packets." (OA at p.4 (bold added; emphasis in the original).) Applicant respectfully submits that the "portion of the received packets" is equivalent to the first portion of packets recited in the claims. Applicant further submits that the "one or more of the portion of the received packets" is equivalent to the second portion of packets

recited in the claims. The Office Action's emphasis of these phrases clearly indicates that one of ordinary skill in the art would recognize this equivalency despite the difference in nomenclature. Thus, Applicant submits that the lack of written description rejection of claims 1, 8, and 15 is improper since the specification provides an equivalent description of the claimed subject matter without using the exact terms recited in the claims.

Based on the foregoing, Applicant submits that Figure 4, and paragraphs [0056] and [0057], describe "wherein the second portion of packets is a portion of the first portion of packets; and determining, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule" in such a way as to reasonably convey to one of ordinary skill in the art that the inventors were in possession of the claimed invention at the time the application was filed. Accordingly, Applicant respectfully requests that the lack of written description rejection of independent claims 1, 8, and 15 under pre-AIA 35 U.S.C. § 112, first paragraph, be withdrawn.

Rejections Under 35 U.S.C. § 103

Claims 1-3, 5, 8-10, 12, and 15-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2011/0055916 to Ahn ("*Ahn*") in view of U.S. Patent Application Publication No. 2012/0084866 to Stolfo ("*Stolfo*"). Claims 4, 8, and 11, stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ahn* in view of *Stolfo* and further in view of U.S. Patent Application Publication No. 2008/0086435 to Chesla ("*Chesla*") and U.S. Patent Application Publication No. 2002/0083345 to Halliday et al. ("*Halliday*"). Claims 5 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ahn* in view of *Stolfo*, and further in view of U.S. Patent Application Publication No. 2003/0005122 to Freimuth et al. ("*Freimuth*"). Claims 6, 13, and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ahn* in view of *Stolfo*, and further in view of U.S. Patent Application Publication No. 2007/0291789 to Kutt et al. ("*Kutt*"). Claims 7, 14, and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ahn* in view of *Stolfo* and further in view of U.S. Patent Application Publication No. 2002/0186683 to Buck et al. ("*Buck*")

Applicant respectfully traverses the rejections above and submits that *Ahn*, *Stolfo*, *Chesla*, *Halliday*, *Freimuth*, *Kutt*, and *Buck* (collectively "the cited references"), taken alone or in

combination, do not disclose or suggest "apply[ing], to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to prevent an exfiltration operation, wherein the at least one packet transformation function indicates whether each packet in the second portion of packets is allowed to continue toward its destination" as recited in independent claims 1, 8, and 15.

The Office Action states that *Ahn* does not disclose or suggest the above-quoted feature. (OA at p. 6.) Instead, the Office Action turns to *Stolfo* to teach "apply[ing], to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to prevent an exfiltration operation, wherein the at least one packet transformation function indicates whether each packet in the second portion of packets is allowed to continue toward its destination."

While *Stolfo* describes "trap-based defensive mechanisms that can be used to confuse, deceive, and/or detect nefarious inside attackers that attempt to exfiltrate and/or use information" (*Stolfo* at ¶[0039]), *Stolfo* does not disclose or suggest "apply[ing], to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to prevent an exfiltration operation" as recited in claims 1, 8, and 15. Instead, *Stolfo* describes "generating decoy traffic[.]" (*Id.* at ¶[0116].) *Stolfo* explains that "[d]ifferent types of decoy traffic can be created, such as Gmail authentication cookies, URLs, passwords for unencrypted protocols as SMTP, POP, and IMP; and beaconed documents such as email attachments." (*Id.* at ¶[0120].) *Stolfo* describes that network statistics may be used to "modify the decoy traffic such that it appears statistically similar to normal traffic." (*Id.* at ¶[0124].) Thus, *Stolfo* describes generating decoy traffic and not applying a transformation to existing network traffic. Therefore, *Stolfo* does not disclose or suggest "apply[ing], to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to prevent an exfiltration operation, wherein the at least one packet transformation function indicates whether each packet in the second portion of packets is allowed to continue toward its destination" as recited in claims 1, 8, and 15.

Moreover, the decoy traffic used in *Stolfo* does not prevent an exfiltration operation. Instead, *Stolfo* explains that "[t]hese traps use decoy information . . . to attract, deceive, and/or confuse attackers (e.g., inside attackers, external attackers, etc.) and/or malware." (*Id.*) *Stolfo*

further explains that "decoy information can be used to reduce the level of system knowledge of an attacker, entice the attacker to perform actions that reveal their presence and/or identities, and uncover and track the unauthorized activities of the attacker." (*Id.*) Accordingly, *Stolfo* does not disclose or suggest "apply[ing], to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to prevent an exfiltration operation" as recited in claims 1, 8, and 15. (Emphasis added).

Based on the foregoing, Applicant submits that *Ahn* and *Stolfo*, taken alone or in combination, do not disclose or suggest the above-quoted features of independent claims 1, 8, and 15. Accordingly, Applicant respectfully requests that the obviousness rejection of claims 1, 8, and 15 under 35 U.S.C. § 103 be withdrawn.

Further, since dependent claims incorporate all the features of their respective base claims, Applicant submits that claims 2-7, 9-14, and 16-20 are patentable over the cited references for at least the reasons discussed above, as well as on their own merits. Therefore, Applicant respectfully requests that the obviousness rejection of claims 2-7, 9-14, and 16-20 under 35 U.S.C. § 103 also be withdrawn.

CONCLUSION

All issues having been addressed, Applicant respectfully submits that the instant application is in condition for allowance, and respectfully solicits prompt notification of the same. However, if for any reason the Examiner believes the application is not in condition for allowance or there are any questions, the Examiner is requested to contact the undersigned at (202) 824-3348.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Dated: November 4, 2019

Respectfully submitted,

By: /Christian LaForgia/
Christian LaForgia
Registration No.: 71,227

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Electronic Patent Application Fee Transmittal

Application Number:	15614956
Filing Date:	06-Jun-2017
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Filer:	Christian A. LaForgia/Michelle Reed
Attorney Docket Number:	007742.00091\US

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	2252	1	300	300
Miscellaneous:				
			Total in USD ($)	**300**

Electronic Acknowledgement Receipt

EFS ID:	37649846
Application Number:	15614956
International Application Number:	
Confirmation Number:	9334
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Customer Number:	22907
Filer:	Christian A. LaForgia/Michelle Reed
Filer Authorized By:	Christian A. LaForgia
Attorney Docket Number:	007742.00091\US
Receipt Date:	04-NOV-2019
Filing Date:	06-JUN-2017
Time Stamp:	16:43:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$300
RAM confirmation Number	E2019A4G44220968
Deposit Account	190733
Authorized User	Michelle Reed

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	RCE.PDF	1349895 0ed929a358d09e513289ee1ad8508fb8d7f3e6ec	no	3
Warnings:					
Information:					
2		Amendment.PDF	67112 9576f5076261898f201fc8588443115364d11de0	yes	13

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment Submitted/Entered with Filing of CPA/RCE	1	1
	Claims	2	8
	Applicant Arguments/Remarks Made in an Amendment	9	13

Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30663 2a33ea93d8a11fc2f91bf1f4a04d4868489824da	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1447670		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/614,956	06/06/2017	Sean Moore	007742.00091\US	9334

22907 7590 06/03/2019

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EXAMINER	
NGUYEN, ANH NGOC M	

ART UNIT	PAPER NUMBER
2473	

NOTIFICATION DATE	DELIVERY MODE
06/03/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

GPD@bannerwitcoff.com
eofficeaction@bannerwitcoff.com

Office Action Summary	Application No. 15/614,956	Applicant(s) Moore, Sean	
	Examiner Anh Ngoc M Nguyen	Art Unit 2473	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 03/27/2019.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-20 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 03/27/2019.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

-2DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Response to Amendment

Applicant's Arguments/Remarks filed March 27, 2019 with respect to claims 1 – 20 have been considered and they are mooted in view of the new ground(s) of rejection as necessitated by Applicant's amendments to independent claims 1, 8, and 15.

Applicant's amendments to independent claims 1, 8, and 15 filed March 27, 2019 overcome the double patent rejection on the claims.

Claims 1 – 20 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 8, and 15 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably

convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1, 8, and 15 recite "wherein the second portion of packets is a portion of the first portion of packets; and determining, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule..." which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. Figure 4 only describes packets may be received, a determination may be made as to whether a portion of the received packets have packet header field values corresponding to a packet filtering rule, and a determination may be made as to whether one or more of the portion of the received packets have application header field values corresponding to one or more application header field criteria.

> [0056] FIG. 4 illustrates an exemplary method for protecting a secured network in accordance with one or more embodiments of the present disclosure. The steps may be performed at one or more packet security gateways associated with a security policy management server. For example, each of packet security gateways 110 and 112 may be associated with security policy management server 114, and the steps may be performed at packet security gateway 110 or 112. At step 400, packets may be received. For example, packet security gateway 110 may receive packets from network 104 via network interface 208 that are destined for network 106. At step 402, a determination may be made as to whether a portion of the received packets have packet header field values corresponding to a packet filtering rule. For example, a determination may be made as to whether a portion of the packets received from network 104 have packet header field values (e.g., one or more of one or more data section protocols, one or more source IP addresses, one or more source ports, one or more destination IP addresses, or one or more destination ports) corresponding to rule 5 310. At step 404, responsive to determining that one or more of the portion of received packets have packet header field values corresponding to the packet filtering rule, an operator specified by the packet filtering rule may be applied to the portion of the received packets. For example, the

REQUIRE TLS-1.1-1.2 operator specified by rule 5 310 may be applied to the portion of the received packets.

[0057] At step 406, a determination may be made as to whether one or more application header field values of one or more of the portion of the received packets correspond to one or more application header field criteria specified by the operator. For example, a determination may be made as to whether one or more of the portion of the received packets have application header field values corresponding to one or more application header field criteria of the REQUIRE TLS-1.1-1.2 operator specified by rule 5 310 (e.g., application header field values corresponding to TLS version 1.1 or 1.2). At step 408, responsive to determining that one or more of the portion of received packets have application header field values corresponding to one or more application header field criteria specified by the operator, a packet transformation function specified by the operator may be applied to the one or more of the portion of the received packets. For example, an ALLOW packet transformation function specified by the REQUIRE TLS-1.1-1.2 operator may be applied to the one or more of the portion of the received packets having application header field values corresponding to one or more application header field criteria of the REQUIRE TLS-1.1-1.2 operator specified by rule 5 310 (e.g., each of the one or more of the portion of the received packets may be allowed to continue toward their respective destinations). The method may then return to step 400 and await receipt of one or more additional packets (e.g., one or more additional packets from network 104 received via network interface 208 that are destined for network 106).

Claim Objections

Claim 1 is objected to because of the following informalities:

Applicant is advised to amend claim 1 in lines 24 from "an prevent exfiltration operation" to "~~an~~ prevent an exfiltration operation."

Appropriate correction is required.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 3, 5, 8 – 10, 12, and 15 – 17 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ahn (US Pub. No. 2011/00559916) in view of Stolfo (US Pub. No. 2012/0084866).

Regarding claim 1, Ahn discloses a method comprising: receiving, by a computing system comprising memory and at least one processor (see Fig. 2, a firewall 200 with a processor 204 and packet filter 108 coupled to rule subset 208), a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets, wherein the second portion of packets is a portion of the first portion of packets (see Fig. 2, para. 0009, 0021, a network firewall for receiving packets…); determining, based on a packet header field value (see para. 0017, 0030, compares traffic data (i.e., packets) such as header fields to a set of one or more rules…), whether each packet of the plurality of packets comprises data corresponding to first criterion specified by one or more packet-filtering rules; responsive to a determination by the computing system that a packet header field value of the first portion of packets comprises data corresponding to the first criterion specified by the at least one matching packet-filtering

rule (see para. 0007, packets are filtered at the firewall using sorted rules in the subset by using binary search...to compare each packet to the sorted rules in the subset until the packet is allowed or denied...); applying, by the computing system and to each packet in the first portion of packets, one or more operators specified by the at least one matching packet-filtering rule (see Fig. 2, Fig. 4, note the denied packets (discard), para. 0016, 0020, 0030 – 0031, packets that traverse the firewall are checked against each rule in the rule set until the first matching rule is found and its associated action is applied…such as action DENY).

Ahn discloses the claimed limitations as stated above. However, Ahn does not specifically disclose the following features: regarding claim 1, determining, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule; and responsive to determining the second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, applying, by the computing system and to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to prevent an exfiltration operation.

Regarding claim 1, Stolfo discloses determining, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule (see para. 0119, deception system 114 can, using one or more pre-defined rules, analyze the inputted trace data to determine protocol types based on the content of application layer headers…); and responsive to determining the second portion of packets that

comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, applying, by the computing system and to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to prevent an exfiltration operation (see para. 0120, 0122, 0124, 0128, 0182, if the inputted network data matches criteria of pre-defined rule sets, deception system 114 can separate the inputted network data and create a set of candidate flows…one or more rules can be applied to modify the candidate flows with decoy information which is to prevent inside attackers from detecting normal data traffic).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn, and have the features, as taught by Stolfo, in order to prevent unauthorized and illegitimate access to systems and information, as discussed by Stolfo (para. 0006).

Regarding claim 2, Ahn discloses wherein: the first portion of packets comprises a packet header field value (see para. 0030, packets with header fields) indicating a protocol type associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a protocol type of TCP or UDP).

Regarding claim 3, Ahn discloses wherein: the first portion of packets comprises data indicating a destination port number associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a destination port of 80, 25, or 53…).

Regarding claim 8, Ahn discloses an apparatus comprising: at least one processor; and memory storing instructions that, when executed by the at least one processor, cause the apparatus (see Fig. 2, a firewall 200 with a processor 204 and packet filter 108 coupled to rule subset 208) to: receive a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets, wherein the second portion of packets is a portion of the first portion of packets (see Fig. 2, para. 0009, 0021, a network firewall for receiving packets…); determine, based on a packet header field value (see para. 0017, 0030, compares traffic data (i.e., packets) such as header fields to a set of one or more rules…), whether the plurality of packets comprises data corresponding to first criterion specified by one or more packet-filtering rules; responsive to a determination that a packet header field value of the first portion of packets comprises data corresponding to the first criterion specified by at least one matching packet-filtering rule (see para. 0007, packets are filtered at the firewall using sorted rules in the subset by using binary search...to compare each packet to the sorted rules in the subset until the packet is allowed or denied...), apply, to each packet in the first portion of packets, one or more operators specified by the at least one matching packet-filtering rule (see Fig. 2, Fig. 4, note the denied packets (discard), para. 0016, 0020, 0030 – 0031, packets that traverse the firewall are checked against each rule in the rule set until the first matching rule is found and its associated action is applied…such as action DENY).

Ahn discloses the claimed limitations as stated above. However, Ahn does not specifically disclose the following features: regarding claim 8, determine, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule; and responsive to determining the

second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, apply to each packet in the second portion of packets, at least one packet transformation function configured to prevent an exfiltration operation.

Regarding claim 8, Stolfo discloses determine, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule (see para. 0119, deception system 114 can, using one or more pre-defined rules, analyze the inputted trace data to determine protocol types based on the content of application layer headers…); and responsive to determining the second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, apply to each packet in the second portion of packets, at least one packet transformation function configured to prevent an exfiltration operation (see para. 0120, 0122, 0124, 0128, 0182, if the inputted network data matches criteria of pre-defined rule sets, deception system 114 can separate the inputted network data and create a set of candidate flows…one or more rules can be applied to modify the candidate flows with decoy information which is to prevent inside attackers from detecting normal data traffic).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn, and have the features, as taught by Stolfo, in order to prevent unauthorized and illegitimate access to systems and information, as discussed by Stolfo (para. 0006).

Regarding claim 9, Ahn discloses wherein: the first portion of packets comprises a packet header field value (see para. 0030, packets with header fields) indicating a protocol type associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a protocol type of TCP or UDP).

Regarding claim 10, Ahn discloses wherein: the first portion of packets comprises data indicating a destination port number associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a destination port of 80, 25, or 53…).

Regarding claim 15, Ahn discloses one or more non-transitory computer-readable media comprising instructions that, when executed by one or more computing devices, cause the one or more computing devices to (see Fig. 2, a firewall 200 with a processor 204 and packet filter 108 coupled to rule subset 208): receive a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets, wherein the second portion of packets is a portion of the first portion of packets (see Fig. 2, para. 0009, 0021, a network firewall for receiving packets…); determine, based on a packet header field value (see para. 0017, 0030, compares traffic data (i.e., packets) such as header fields to a set of one or more rules…), whether the plurality of packets comprises data corresponding to first criterion specified by one or more packet-filtering rules; responsive to a determination that a packet header field value of the first portion of packets comprises data corresponding to the first criterion specified by at least one matching packet-filtering rule (see para. 0007, packets are filtered at the firewall using sorted rules in the subset by using binary search...to compare each

packet to the sorted rules in the subset until the packet is allowed or denied...), apply, to each packet in the first portion of packets, one or more operators specified by the at least one matching packet-filtering rule (see Fig. 2, Fig. 4, note the denied packets (discard), para. 0016, 0020, 0030 – 0031, packets that traverse the firewall are checked against each rule in the rule set until the first matching rule is found and its associated action is applied…such as action DENY).

Ahn discloses the claimed limitations as stated above. However, Ahn does not specifically disclose the following features: regarding claim 15, determine, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule; and responsive to determining the second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, apply to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to prevent an exfiltration operation.

Regarding claim 15, Stolfo discloses determine, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule (see para. 0119, deception system 114 can, using one or more pre-defined rules, analyze the inputted trace data to determine protocol types based on the content of application layer headers…); and responsive to determining the second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, apply to each packet in the second portion of packets that match the second criterion, at least one packet transformation function

configured to prevent an exfiltration operation (see para. 0120, 0122, 0124, 0128, 0182, if the inputted network data matches criteria of pre-defined rule sets, deception system 114 can separate the inputted network data and create a set of candidate flows…one or more rules can be applied to modify the candidate flows with decoy information which is to prevent inside attackers from detecting normal data traffic).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn, and have the features, as taught by Stolfo, in order to prevent unauthorized and illegitimate access to systems and information, as discussed by Stolfo (para. 0006).

Regarding claim 16, Ahn discloses wherein: the first portion of packets comprises a packet header field value (see para. 0030, packets with header fields) indicating a protocol type associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a protocol type of TCP or UDP).

Regarding claim 17, Ahn discloses wherein: the first portion of packets comprises data indicating a destination port number associated with a particular type of data transfer, and corresponding to the first criterion specified by the at least one matching packet-filtering rule (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a destination port of 80, 25, or 53…).

Claims 4, 11, and 18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ahn (US Pub. No. 2011/00559916) in view of Stolfo (US Pub. No. 2012/0084866) and further in view of Chesla et al. (US Pub. No. 2008/0086435) and Halliday et al. (US Pub. No. 2002/0083345).

Ahn and Stolfo do not disclose the following features: regarding claim 4, wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets, wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, the method further comprising: allowing each packet of the third portion of packets to continue toward its respective destination; and blocking each packet of the fourth portion of packets from continuing toward its respective destination; regarding claim 11, wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets, wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the at least one processor cause the apparatus to: allow each packet of the third portion of packets to continue toward its respective destination; and block each packet of the fourth portion of packets from continuing toward its respective destination; regarding claim 18, wherein the application header field value identifies

one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets, wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the one or more computing devices, cause the one or more computing devices to: allow each packet of the third portion of packets to continue toward its respective destination; and block each packet of the fourth portion of packets from continuing toward its respective destination.

Regarding claim 4, the combination of Chesla and Halliday discloses wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets (see Halliday: para. 0039, identifying header data; Fig. 2, Fig. 6, HTTP headers 6B, para. 0043), wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, the method further comprising: allowing each packet of the third portion of packets to continue toward its respective destination (see Chesla: para. 0407, 0412, block HTTP request that is not GET…hence GET is allowed to pass); and blocking each packet of the fourth portion of packets from continuing toward its respective destination (see Halliday: para. 0010, denying HTTP POST request…).

Regarding claim 11, the combination of Chesla and Halliday discloses wherein the application header field value identifies one or more hypertext transfer protocol (HTTP)

methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets (see Halliday: para. 0039, identifying header data; Fig. 2, Fig. 6, HTTP headers 6B, para. 0043), wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the at least one processor cause the apparatus to: allow each packet of the third portion of packets to continue toward its respective destination (see Chesla: para. 0407, 0412, block HTTP request that is not GET…hence GET is allowed to pass); and block each packet of the fourth portion of packets from continuing toward its respective destination (see Halliday: para. 0010, denying HTTP POST request…).

Regarding claim 18, the combination of Chesla and Halliday discloses wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets (see Halliday: para. 0039, identifying header data; Fig. 2, Fig. 6, HTTP headers 6B, para. 0043), wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the one or more computing devices, cause the one or more computing devices to: allow each packet of the third portion of packets to continue toward its respective destination (see Chesla: para. 0407, 0412, block HTTP request that is not GET…hence GET is allowed to

pass); and block each packet of the fourth portion of packets from continuing toward its respective destination (see Halliday: para. 0010, denying HTTP POST request…).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn and Stolfo, and have the features, as taught by the combination of Chesla and Halliday, in order to mitigate the attack effectively while letting legitimate traffic to pass, as discussed by Chesla (abstract) and in order to provide protection to a communication by a firewall, as discussed by Halliday (para. 0003).

Claims 5 and 12 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ahn (US Pub. No. 2011/00559916) in view of Stolfo (US Pub. No. 2012/0084866) and further in view of Freimuth et al. (US Pub. No. 2003/0005122).

Ahn and Stolfo do not disclose the following features: regarding claim 5, the method further comprising: allowing, based on a determination that the application header field value indicates a request for specified resource data, each packet of the second portion of packets indicating a request for specified resource data to continue toward its respective destination; and blocking, based on a determination that the application header field value indicates a request to submit data to be processed by a specified resource, each packet of the second portion of packets indicating a request to submit data to be processed by the specified resource from continuing toward its respective destination; regarding claim 12, wherein the instructions, when executed by the one or more computing devices, cause the apparatus to: allow, based on a determination that the application header field value indicates a request for data from a specified resource, each packet of the second portion of packets indicating a request for data from a specified resource to continue toward its respective destination; and block, based on a determination that the

application header field value indicates a request to submit data to be processed by a specified resource, each packet of the second portion of packets indicating a request to submit data to be processed by a specified from continuing toward its respective destination.

Regarding claim 5, Freimuth discloses the method further comprising: allowing, based on a determination that the application header field value indicates a request for specified resource data, each packet of the second portion of packets indicating a request for specified resource data to continue toward its respective destination (see Fig. 2, action rules: schedule order, para. 0033, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule is to perform schedule ordering and establish a connection…); and blocking, based on a determination that the application header field value indicates a request to submit data to be processed by a specified resource, each packet of the second portion of packets indicating a request to submit data to be processed by the specified resource from continuing toward its respective destination (see Fig. 2, para. 0029, 0031, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule is to drop the connection).

Regarding claim 12, Freimuth discloses wherein the instructions, when executed by the one or more computing devices, cause the apparatus to: allow, based on a determination that the application header field value indicates a request for data from a specified resource, each packet of the second portion of packets indicating a request for data from a specified resource to continue toward its respective destination (see Fig. 2, action rules: schedule order, para. 0033, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule is to perform schedule

ordering and establish a connection…); and block, based on a determination that the application header field value indicates a request to submit data to be processed by a specified resource, each packet of the second portion of packets indicating a request to submit data to be processed by a specified from continuing toward its respective destination (see Fig. 2, para. 0029, 0031, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule is to drop the connection).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn and Stolfo, and have the features, as taught by Freimuth, in order to protect Web servers against overload by controlling the amount and rate of work entering the systems, as discussed by Freimuth (abstract).

Claims 6, 13, and 19 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ahn (US Pub. No. 2011/00559916) in view of Stolfo (US Pub. No. 2012/0084866) and further in view of Kutt et al. (US Pub. No. 2007/0291789).

Ahn and Stolfo do not disclose the following features: regarding claim 6, further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular transport layer security (TLS) version value; regarding claim 13, wherein the instructions, when executed by the one or more computing devices, cause the apparatus to drop packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular transport layer security (TLS) version value; regarding claim 19, further comprising dropping packets associated with a particular type of data transfer responsive

to a determination that the packets associated with the particular type of data transfer comprises data corresponding to a particular transport layer security (TLS) version value.

Regarding claim 6, Kutt discloses further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular transport layer security (TLS) version value (see para. 0007, the detection and blocking of HTTP messages may be done by third parties or firewalls where HTTP messages are encrypted by using a version of transport layer security (TLS) protocol).

Regarding claim 13, Kutt discloses wherein the instructions, when executed by the one or more computing devices, cause the apparatus to drop packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular transport layer security (TLS) version value (see para. 0007, the detection and blocking of HTTP messages may be done by third parties or firewalls where HTTP messages are encrypted by using a version of transport layer security (TLS) protocol).

Regarding claim 19, Kutt discloses further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprises data corresponding to a particular transport layer security (TLS) version value (see para. 0007, the detection and blocking of HTTP messages may be done by third parties or firewalls where HTTP messages are encrypted by using a version of transport layer security (TLS) protocol).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn and Stolfo, and have the features, as taught by Kutt, in

order to have a significant benefit in reducing the number of system entities that are exposed to sensitive information, as discussed by Kutt (para. 0036).

Claims 7, 14, and 20 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ahn (US Pub. No. 2011/00559916) in view of Stolfo (US Pub. No. 2012/0084866) and further in view of Buck et al. (US Pub. No. 2002/0186683).

Ahn and Stolfo do not disclose the following features: regarding claim 7, further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular real-time transport protocol value; regarding claim 14, wherein the instructions, when executed by the one or more computing devices, cause the apparatus to drop packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular real-time transport protocol value; regarding claim 20, further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular real-time transport protocol value.

Regarding claim 7, Buck discloses further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular real-time transport protocol value (see para. 0050, 0056, that all UDP (or RTP) packet transfers are blocked by the firewall 20).

Regarding claim 14, Buck discloses wherein the instructions, when executed by the one or more computing devices, cause the apparatus to drop packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular real-time transport protocol value (see para. 0050, 0056, that all UDP (or RTP) packet transfers are blocked by the firewall 20).

Regarding claim 20, Buck discloses further comprising dropping packets associated with a particular type of data transfer responsive to a determination that the packets associated with the particular type of data transfer comprise data corresponding to a particular real-time transport protocol value (see para. 0050, 0056, that all UDP (or RTP) packet transfers are blocked by the firewall 20).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn and Stolfo, and have the features, as taught by Buck, in order to utilize a computer device that is protected by a firewall security system that does not allow transmissions of voice data using connectionless packet protocol over the firewall or reception of voice data over the Internet from the unknown (non-secure) third parties, as discussed by Buck (para. 0009).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Examiner's Note: Examiner has cited particular paragraphs, columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and, also to verify and ascertain the metes and bounds of the Claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh Ngoc M Nguyen whose telephone number is (571)270-5139. The examiner can normally be reached on Monday to Friday, from 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Bin Yao can be reached on ((571)272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice .

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ANH NGOC M NGUYEN/
Primary Examiner, Art Unit 2473

Notice of References Cited	Application/Control No. 15/614,956	Applicant(s)/Patent Under Reexamination Moore, Sean	
	Examiner Anh Ngoc M Nguyen	Art Unit 2473	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20120084866-A1	04-2012	Stolfo; Salvatore J.	G06F21/554	726/25
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
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	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/614,956	Moore, Sean
	Examiner	Art Unit
	Anh Ngoc M Nguyen	2473

CPC - Searched*		
Symbol	Date	Examiner
h04l45/74, 745 h04l63/0254, 0236, 0263 -- see search history	05/23/2019	AN

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
searched for double patenting; inventors; assignee; EAST database, subgroups combined with texts search for invention	05/23/2019	AN

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/614,956	Moore, Sean
	Examiner	Art Unit
	Anh Ngoc M Nguyen	2473

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/24/2018	05/24/2019							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
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	16	✓	✓							
	17	✓	✓							
	18	✓	✓							
	19	✓	✓							
	20	✓	✓							

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15614956
Filing Date	2017-06-06
First Named Inventor	Sean Moore
Art Unit	2473
Examiner Name	A. N. M. Nguyen
Attorney Docket Number	007742.00091\US

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20060159028	A1	2006-07-20	Curran-Gray et al.	
	2	20100115621	A1	2010-05-06	Staniford et al.	
	3	20140082730	A1	2014-03-20	Vashist et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	4	20160028751	A1	2016-01-28	Cruz Mota et al.	
	5	20040015719	A1	2004-01-22	Lee et al.	
	6	20040131056	A1	2004-07-08	Dark	
	7	20050249214	A1	2005-11-10	Peng	
	8	20060031928	A1	2006-02-09	Conley et al.	
	9	20080028467	A1	2008-01-31	Kommareddy et al.	
	10	20080080493	A1	2008-04-03	Weintraub et al.	
	11	20080101234	A1	2008-05-01	Nakil et al.	
	12	20140215561	A1	2014-07-31	Roberson et al.	
	13	20150128274	A1	2015-05-07	Giokas	
	14	20150135325	A1	2015-05-14	Stevens et al.	

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	15	20150207809	A1	2015-07-23	Macaulay	
	16	20150256431	A1	2015-09-10	Buchanan et al.	
	17	20140082204	A1	2014-03-20	Shankar et al.	
	18	20140337613	A1	2014-11-13	Martini	
	19	20030088787	A1	2003-05-08	Egevang	
	20	20100195503	A1	2010-08-05	Raleigh	
	21	20020152209	A1	2002-10-17	Merugu et al.	
	22	20040114518	A1	2004-06-17	MacFaden et al.	
	23	20080320116	A1	2008-12-25	Briggs	
	24	20170223046	A1	2017-08-03	Singh	
	25	20160191558	A1	2016-06-30	Davison	

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	26	20100202299	A1	2010-08-12	Strayer et al.	
	27	20080313738	A1	2008-12-18	Enderby	
	28	20080201772	A1	2008-08-21	Mondaeev et al.	
	29	20070056038	A1	2007-03-08	Lok	
	30	20130139236	A1	2013-05-30	Rubinstein et al.	

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	1	2018 Aug 9 (US) Non-Final Office Action - App. 15/413,947 (007742.00086)	

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	2	2018 Sep 4 (WO) International Search Report and Written Opinion - App. PCT/US2018/041355 (007742.00115)	
	3	Anonymous: "The Distribution of Malicious Domains," The DomainTools Report, 2016 Edition, 9 March 2016 (2016-03-09), pages 1-11, XP055502306, Retrieved from: https://www.domaintools.com/resources/white-papers/the-domaintools-report-the-distribution-of-malicious-domains	
	4	2018 Oct 4 (US) Non-Final Office Action - App. 16/030,374 (007742.00110)	
	5	2018 Oct 4 (US) Notice of Allowance - App. 15/827,477 (007742.00101)	
	6	"Cisco ACNS Softward Configuration Guide for Centrally Managed Deployments," Release 5.5. Text Part Number: OL-9136-01, Ciswco Systems, Inc., 2006, 944 pages.	
	7	Blake, et al., "An Architecture for Differentiated Services," also known as the Diffserv architecture, as defined in RFC 2475, Network Working Group, Decemer 1998, 36 pages.	
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	16	2019 Feb 6 (US) Notice of Allowance and Fees Due - App. 16/039,896 (007742.00112)	
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	20	2019 Mar 8 (US) Notice of Allowance and Fees Due - App. 16/030,374 (007742.00110)	
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	22	2018 Aug 15 (US) Declaration of Staurt Staniford, PhD in Support of Petition for Inter Partes Review of U.S. Patent No. 9,686,193 - IPR2018-01556	
	23	2019 Jan 24 (US) Decision - Institution of Inter Partes Review of U.S. Patent 9,160,713 B2 - IPR 2018-01437	

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	24	2019 Jan 24 (US) Decision - Institution of Inter Partes Review of U.S. Patent 9,124,552 B2 - IPR 2018-01436	

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Examiner Signature	/ANH NGOC M NGUYEN/	Date Considered	05/24/2019

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Art Unit	2473
Examiner Name	A. N. M. Nguyen
Attorney Docket Number	007742.00091\US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2019-03-27
Name/Print	Joshua D. Schneider	Registration Number	67,194

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Filing Date	2017-06-06
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Art Unit	2473
Examiner Name	A. N. M. Nguyen
Attorney Docket Number	007742.00091\US

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	1	8510821	B1	2013-08-13	Brandwine et al.	
	2	7225269	B2	2007-05-29	Watanabe	
	3	7152240	B1	2006-12-19	Green et al.	
	4	8331234	B1	2012-12-11	Newton et al.	
	5	9531672	B1	2016-12-27	Li et al.	
	6	8156206	B2	2012-04-10	Kiley et al.	
	7	7499412		2009-03-03	Matityahu et al.	
	8	9634911		2017-04-25	Meloche	

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	Attorney Docket Number	007742.00091\US

	9	8422391		2013-04-16	Zhu	
	10	8219675		2012-07-10	Ivershen	
	11	7849502		2010-12-07	Bloch et al.	
	12	7185368		2007-02-27	Copeland, III	
	13	8271645		2012-09-18	Rajan et al.	
	14	6971028	B1	2005-11-29	Lyle et al.	

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That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

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See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	
Name/Print	Joshua D. Schneider	Registration Number	67,194

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L5	3	"20120084866".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/24 08:45
L6	3	"20080086435".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/24 09:36
L7	3	"20020083345".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/24 09:37
S1	1	"15614956"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 09:12
S2	19	((("Centripetal") near3 ("Networks") near3 ("Inc"))).AS,AANM.	USPAT	OR	ON	2019/05/23 09:12
S3	145	((("Moore") near3 ("Sean"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/23 09:12
S4	44	("20020152209" | "20030088787" | "20040015719" | "20040114518" | "20040131056" | "20050249214" | "20060031928" | "20060159028" | "20070056038" | "20080028467" | "20080080493" | "20080101234" | "20080201772" | "20080313738" | "20080320116" | "20100115621" | "20100195503" | "20100202299" | "20130139236" | "20140082204" | "20140082730" | "20140215561" | "20140337613" | "20150128274" | "20150135325" | "20150207809" | "20150256431" | "20160028751" | "20160191558" | "20170223046" | "6971028" | "7152240" | "7185368" | "7225269" | "7499412" | "7849502" | "8156206" | "8219675" | "8271645" |	US-PGPUB; USPAT	OR	ON	2019/05/23 10:28

		"8331234" | "8422391" | "8510821" | "9531672" | "9634911").PN.				
S5	1	"9160713".PN.	US-PGPUB; USPAT	OR	ON	2019/05/23 11:43
S6	1	"9124552".PN.	US-PGPUB; USPAT	OR	ON	2019/05/23 11:46
S7	8	application near4 header$1 same exfiltrat$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 11:52
S8	68	application near4 header$1 and exfiltrat$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 11:53
S9	47	application near4 header$1 same (prevent$3 avoid$3) near4 (attack$3 threat$1 intruder$1 malicious steal$3 exfiltrat$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 11:56
S11	183	((application near4 header$1) same rule$1) and (prevent$3 avoid$3) near4 (attack$3 threat$1 intruder$1 malicious steal$3 exfiltrat$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:27
S12	10838	h04l45/74.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:27
S13	7	S11 and S12	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:27
S14	9126	h04l45/745.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:27
S15	1	S11 and S14	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2019/05/23 12:27

			DERWENT; IBM_TDB			
S16	2130	h04l63/0254.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:39
S17	9	S11 and S16	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:39
S18	8443	h04l63/0236.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:39
S19	7645	h04l63/0263.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:39
S20	8	S11 and S18	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:39
S21	51	S11 and S19	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:39
S22	76	((application near4 header$1) same rule$1) and (block$3) near4 (attack$3 threat$1 intruder$1 malicious steal$3 exfiltrat$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/05/23 12:49

EAST Search History (Interference)

< This search history is empty>

5/24/2019 10:01:09 AM
C:\Users\anguyen4\Documents\EAST\Workspaces\15614956.wsp

PTO/SB/08a (02-18)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	15614956
Filing Date	2017-06-06
First Named Inventor	Sean Moore
Art Unit	2473
Examiner Name	A. N. M. Nguyen
Attorney Docket Number	007742.00091\US

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8510821	B1	2013-08-13	Brandwine et al.	
	2	7225269	B2	2007-05-29	Watanabe	
	3	7152240	B1	2006-12-19	Green et al.	
	4	8331234	B1	2012-12-11	Newton et al.	
	5	9531672	B1	2016-12-27	Li et al.	
	6	8156206	B2	2012-04-10	Kiley et al.	
	7	7499412		2009-03-03	Matityahu et al.	
	8	9634911		2017-04-25	Meloche	

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	9	8422391		2013-04-16	Zhu	
	10	8219675		2012-07-10	Ivershen	
	11	7849502		2010-12-07	Bloch et al.	
	12	7185368		2007-02-27	Copeland, III	
	13	8271645		2012-09-18	Rajan et al.	
	14	6971028	B1	2005-11-29	Lyle et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20060159028	A1	2006-07-20	Curran-Gray et al.	
	2	20100115621	A1	2010-05-06	Staniford et al.	
	3	20140082730	A1	2014-03-20	VASHIST et al.	

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	4	20160028751	A1	2016-01-28	Cruz Mota et al.	
	5	20040015719	A1	2004-01-22	Lee et al.	
	6	20040131056	A1	2004-07-08	Dark	
	7	20050249214	A1	2005-11-10	Peng	
	8	20060031928	A1	2006-02-09	Conley et al.	
	9	20080028467	A1	2008-01-31	Kommareddy et al.	
	10	20080080493	A1	2008-04-03	Weintraub et al.	
	11	20080101234	A1	2008-05-01	Nakil et al.	
	12	20140215561	A1	2014-07-31	Roberson et al.	
	13	20150128274	A1	2015-05-07	Giokas	
	14	20150135325	A1	2015-05-14	Stevens et al.	

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	15	20150207809	A1	2015-07-23	MACAULAY	
	16	20150256431	A1	2015-09-10	Buchanan et al.	
	17	20140082204	A1	2014-03-20	Shankar et al.	
	18	20140337613	A1	2014-11-13	Martini	
	19	20030088787	A1	2003-05-08	Egevang	
	20	20100195503	A1	2010-08-05	Raleigh	
	21	20020152209	A1	2002-10-17	Merugu et al.	
	22	20040114518	A1	2004-06-17	MacFaden et al.	
	23	20080320116	A1	2008-12-25	Briggs	
	24	20170223046	A1	2017-08-03	Singh	
	25	20160191558	A1	2016-06-30	DAVISON	

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	26	20100202299	A1	2010-08-12	Strayer et al.	
	27	20080313738	A1	2008-12-18	Enderby	
	28	20080201772	A1	2008-08-21	Mondaeev et al.	
	29	20070056038	A1	2007-03-08	Lok	
	30	20130139236	A1	2013-05-30	Rubinstein et al.	

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	1	2018 Aug 9 (US) Non-Final Office Action - App. 15/413,947 (007742.00086)	

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	2	2018 Sep 4 (WO) International Search Report and Written Opinion - App. PCT/US2018/041355 (007742.00115)
	3	Anonymous: "The Distribution of Malicious Domains," The DomainTools Report, 2016 Edition, 9 March 2016 (2016-03-09), pages 1-11, XP055502306, Retrieved from: https://www.domaintools.com/resources/white-papers/the-domaintools-report-the-distribution-of-malicious-domains
	4	2018 Oct 4 (US) Non-Final Office Action - App. 16/030,374 (007742.00110)
	5	2018 Oct 4 (US) Notice of Allowance - App. 15/827,477 (007742.00101)
	6	"Cisco ACNS Softward Configuration Guide for Centrally Managed Deployments," Release 5.5. Text Part Number: OL-9136-01, Ciswco Systems, Inc., 2006, 944 pages.
	7	Blake, et al., "An Architecture for Differentiated Services," also known as the Diffserv architecture, as defined in RFC 2475, Network Working Group, Decemer 1998, 36 pages.
	8	2018 Sep 27 (WO) International Search Report and Written Opinion - App. PCT/US2018/043367
	9	"Examining SSL-encrypted Communications: Netronome SSL InspectorTM Solution Overview," January 1, 2008, XP055036015, retrieved from <http://www.infosecurityproductsguide.com/technology/2008/Netronome_Examining_SSL-encrypted_Communications.pdf>, 8 pages.
	10	2018 Oct 12 (US) Non-Final Office Action - App. 16/039,896 (007742.00112)
	11	2018 Aug 29 (CA) Office Action - App. 2,888,935 (007742.00046)
	12	2018 Nov 14 (US) Final Office Action - App. 14/745,207 (007742.00049)

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	13	2018 Dec 18 (US) Final Office Action - App. 15/610,995 (007742.00090)
	14	2019 Jan 24 (US) Notice of Allowance - App. 15/610,995 (007742.00090)
	15	2019 Feb 6 (US) Final Office Action - App. 15/413,750 (007742.00084)
	16	2019 Feb 6 (US) Notice of Allowance and Fees Due - App. 16/039,896 (007742.00112)
	17	2019 Mar 8 (US) Notice of Allowance and Fees Due - App. 16/060,374 (007742.00110)
	18	2019 Mar 11 (US) Final Office Action - App. 16/030,354 (007742.00114)
	19	2019 Feb 21 (US) Final Office Action - App. 15/382,806 (07742.00082)
	20	2019 Mar 8 (US) Notice of Allowance and Fees Due - App. 16/030,374 (007742.00110)

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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	Filing Date	2017-06-06
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	Art Unit	2473
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Signature		Date (YYYY-MM-DD)	
Name/Print	Joshua D. Schneider	Registration Number	67,194

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Electronic Patent Application Fee Transmittal

Application Number:	15614956
Filing Date:	06-Jun-2017
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Filer:	Joshua Daniel Schneider/Jennifer Brady
Attorney Docket Number:	007742.00091\US

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
		Total in USD ($)		**120**

Electronic Acknowledgement Receipt

EFS ID:	35547690
Application Number:	15614956
International Application Number:	
Confirmation Number:	9334
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Customer Number:	22907
Filer:	Joshua Daniel Schneider/Jennifer Brady
Filer Authorized By:	Joshua Daniel Schneider
Attorney Docket Number:	007742.00091\US
Receipt Date:	27-MAR-2019
Filing Date:	06-JUN-2017
Time Stamp:	15:53:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$120
RAM confirmation Number	032819INTEFSW00002749190733
Deposit Account	190733
Authorized User	Jennifer Brady

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	Information_Disclosure_Statement_Fillable_PDF_19679886.pdf	1036780 6fdff70aa839904a2c2b12e9d3783472731d4799	no	10
Warnings:					
Information:					
2	Non Patent Literature	Non-Final_Rejection__892__1449_19287679.pdf	4474834 08c2ed47c477e17fed0bef873150b168ffc0d466	no	121
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	2018_Sep_4_ISR_PCT_US2018-041355_19342993.PDF	1548743 e9f05a0eb1f0f897f2fdf11f4330d5812d4d90f9	no	14
Warnings:					
Information:					
4	Non Patent Literature	NPL_The_DomainTools_Report_Distribution_Malicious_Domain_19343060.pdf	770481 30f8a57eaa245369f790b0b7b1e533b44f1dfba9	no	11
Warnings:					
Information:					
5	Other Reference-Patent/App/Search documents	Non-Final_Rejection__892__14492_19385872.pdf	2042424 9a286f5abcfde056e309d6fcce608ebff29c3d05	no	61
Warnings:					
Information:					
6	Other Reference-Patent/App/Search documents	Notice_of_Allowance_and_Fees_Due_PTOL-85__INTVSUMEX__892__1449_19385859.pdf	2081740 8ca4c1d389768ee5bedba55738e491fc8467150c	no	90
Warnings:					
Information:					

7	Non Patent Literature	IPR2018-01512_Exhibit_1008_19398728pt1.pdf	22349988 07b8efafe2a15e6cc87f7b28e356c15fe0a435dd	no	472
Warnings:					
Information:					
8	Non Patent Literature	IPR2018-01512_Exhibit_1008_19398728pt2.pdf	15589805 5f8e363d5013c234a8f5f442288cd4c5a285760a	no	472
Warnings:					
Information:					
9	Non Patent Literature	IPR2018-01512_Exhibit_10011_19398734.pdf	88604 ab00f02d92be16345c2f614804dfef9548022113	no	36
Warnings:					
Information:					
10	Other Reference-Patent/App/Search documents	2018_Sept_27_ISR__WO_PCT-US2018-043367_19399844.PDF	842046 64616cf0199263a590b9e3def3f7e81877854e5f	no	14
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11	Non Patent Literature	NPL_METRONOME-2011-ExamSSL-Comm-en_19399920.pdf	9183751 8c7dd2f0a6fd1fd6a90de030bf7cf3100d91c843	no	8
Warnings:					
Information:					
12	Other Reference-Patent/App/Search documents	Non-Final_Rejection__892__14493_19399465.pdf	2263727 a08e9c2177bca73dcfbe27a1eeb5ce58af9c3143	no	61
Warnings:					
Information:					
13	Non Patent Literature	OTT01-9182132-v1-PAT_82827W-1_Corr_from_PTO_-_Office_Action_dtd_08-29-2018_19429528.PDF	2542659 5d8bc2ae27c0c147c9dcc817e55eeef51c98d238	no	4
Warnings:					
Information:					

14	Other Reference-Patent/App/Search documents	Final_Rejection__892__1449_19451743.pdf	1662808 3cc79747bd27df584284d345965428d0982ef405	no	43
Warnings:					
Information:					
15	Other Reference-Patent/App/Search documents	Final_Rejection__892__14492_19506185.pdf	646461 477a7c7a34e6320d2a76c95696bcafc2728df287	no	16
Warnings:					
Information:					
16	Other Reference-Patent/App/Search documents	Notice_of_Allowance_and_Fees_Due_PTOL-85_19565215.pdf	427091 fe5cf81edaaac2551307b584a21c8b1d8b66e526	no	7
Warnings:					
Information:					
17	Other Reference-Patent/App/Search documents	Final_Rejection__892__14493_19586326.pdf	1411297 aef5621d7a023d74d0beb641b3cb7194444 5c0fc	no	36
Warnings:					
Information:					
18	Other Reference-Patent/App/Search documents	Notice_of_Allowance_and_Fees_Due_PTOL-85__1449_19586344.pdf	681500 2ebb52cef7739e6b619bb305953f2b8542b33cea	no	13
Warnings:					
Information:					
19	Other Reference-Patent/App/Search documents	Notice_of_Allowance_and_Fees_Due_PTOL-85__892_19644422.pdf	394932 508415791a76cb2acaa843fa90fd4c8c915c033f	no	6
Warnings:					
Information:					
20	Other Reference-Patent/App/Search documents	Final_Rejection__892_19647299.pdf	959362 f156a0e04645275b684fd22de13b6b2003cf0068	no	22
Warnings:					
Information:					

21	Other Reference-Patent/App/Search documents	Final_Rejection__1449_19614131.pdf	1588151 233b67a7c188694425a73622d228b243d5b53777	no	41
Warnings:					
Information:					
22	Information Disclosure Statement (IDS) Form (SB08)	Information_Disclosure_Statement_Fillable_PDF2_19679327.pdf	1036527 399d98a2383b6e889e1b2171d4ff5d9494e06d78	no	9
Warnings:					
Information:					
23	Non Patent Literature	Petition_19387848.PDF	924783 33c8a9803cf8118687fbda5cf58221fc1b8521c8	no	82
Warnings:					
Information:					
24	Non Patent Literature	Exhibit_1003_-_Declaration_of_Petitioners_Expert_Dr_Stuart_Staniford_Staniford_19387854.PDF	2518689 13800d9beb62fa162e4167208ff8d32c52d050ae	no	131
Warnings:					
Information:					
25	Non Patent Literature	Decision_Institution_of_Inter_Partes_Review_19580177.PDF	715241 4407dc243c586be6c4abc6c4bb108d36e7d1dfc2	no	18
Warnings:					
Information:					
26	Non Patent Literature	Institution_Decision_19566193.PDF	567488 2d901a7d6efac6938f59916a29b0e5f960aa554a	no	37
Warnings:					
Information:					
27	Fee Worksheet (SB06)	fee-info.pdf	30359 874c6f383ede202760f974797ed656b0f9ee1395	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	78380271		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15614956
Filing Date	2017-06-06
First Named Inventor	Sean Moore
Art Unit	2473
Examiner Name	A. N. M. Nguyen
Attorney Docket Number	007742.00091\US

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8510821	B1	2013-08-13	Brandwine et al.	
	2	7225269	B2	2007-05-29	Watanabe	
	3	7152240	B1	2006-12-19	Green et al.	
	4	8331234	B1	2012-12-11	Newton et al.	
	5	9531672	B1	2016-12-27	Li et al.	
	6	8156206	B2	2012-04-10	Kiley et al.	
	7	7499412		2009-03-03	Matityahu et al.	
	8	9634911		2017-04-25	Meloche	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	9	8422391		2013-04-16	Zhu	
	10	8219675		2012-07-10	Ivershen	
	11	7849502		2010-12-07	Bloch et al.	
	12	7185368		2007-02-27	Copeland, III	
	13	8271645		2012-09-18	Rajan et al.	
	14	6971028	B1	2005-11-29	Lyle et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20060159028	A1	2006-07-20	Curran-Gray et al.	
	2	20100115621	A1	2010-05-06	Staniford et al.	
	3	20140082730	A1	2014-03-20	Vashist et al.	

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	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	4	20160028751	A1	2016-01-28	Cruz Mota et al.	
	5	20040015719	A1	2004-01-22	Lee et al.	
	6	20040131056	A1	2004-07-08	Dark	
	7	20050249214	A1	2005-11-10	Peng	
	8	20060031928	A1	2006-02-09	Conley et al.	
	9	20080028467	A1	2008-01-31	Kommareddy et al.	
	10	20080080493	A1	2008-04-03	Weintraub et al.	
	11	20080101234	A1	2008-05-01	Nakil et al.	
	12	20140215561	A1	2014-07-31	Roberson et al.	
	13	20150128274	A1	2015-05-07	Giokas	
	14	20150135325	A1	2015-05-14	Stevens et al.	

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	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	15	20150207809	A1	2015-07-23	Macaulay	
	16	20150256431	A1	2015-09-10	Buchanan et al.	
	17	20140082204	A1	2014-03-20	Shankar et al.	
	18	20140337613	A1	2014-11-13	Martini	
	19	20030088787	A1	2003-05-08	Egevang	
	20	20100195503	A1	2010-08-05	Raleigh	
	21	20020152209	A1	2002-10-17	Merugu et al.	
	22	20040114518	A1	2004-06-17	MacFaden et al.	
	23	20080320116	A1	2008-12-25	Briggs	
	24	20170223046	A1	2017-08-03	Singh	
	25	20160191558	A1	2016-06-30	Davison	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	26	20100202299	A1	2010-08-12	Strayer et al.	
	27	20080313738	A1	2008-12-18	Enderby	
	28	20080201772	A1	2008-08-21	Mondaeev et al.	
	29	20070056038	A1	2007-03-08	Lok	
	30	20130139236	A1	2013-05-30	Rubinstein et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	2018 Aug 9 (US) Non-Final Office Action - App. 15/413,947 (007742.00086)	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	2	2018 Sep 4 (WO) International Search Report and Written Opinion - App. PCT/US2018/041355 (007742.00115)
	3	Anonymous: "The Distribution of Malicious Domains," The DomainTools Report, 2016 Edition, 9 March 2016 (2016-03-09), pages 1-11, XP055502306, Retrieved from: https://www.domaintools.com/resources/white-papers/the-domaintools-report-the-distribution-of-malicious-domains
	4	2018 Oct 4 (US) Non-Final Office Action - App. 16/030,374 (007742.00110)
	5	2018 Oct 4 (US) Notice of Allowance - App. 15/827,477 (007742.00101)
	6	"Cisco ACNS Softward Configuration Guide for Centrally Managed Deployments," Release 5.5. Text Part Number: OL-9136-01, Ciswco Systems, Inc., 2006, 944 pages.
	7	Blake, et al., "An Architecture for Differentiated Services," also known as the Diffserv architecture, as defined in RFC 2475, Network Working Group, Decemer 1998, 36 pages.
	8	2018 Sep 27 (WO) International Search Report and Written Opinion - App. PCT/US2018/043367
	9	"Examining SSL-encrypted Communications: Netronome SSL InspectorTM Solution Overview," January 1, 2008, XP055036015, retrieved from <http://www.infosecurityproductsguide.com/technology/2008/Netronome_Examining_SSL-encrypted_Communications.pdf>, 8 pages.
	10	2018 Oct 12 (US) Non-Final Office Action - App. 16/039,896 (007742.00112)
	11	2018 Aug 29 (CA) Office Action - App. 2,888,935 (007742.00046)
	12	2018 Nov 14 (US) Final Office Action - App. 14/745,207 (007742.00049)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	13	2018 Dec 18 (US) Final Office Action - App. 15/610,995 (007742.00090)
	14	2019 Jan 24 (US) Notice of Allowance - App. 15/610,995 (007742.00090)
	15	2019 Feb 6 (US) Final Office Action - App. 15/413,750 (007742.00084)
	16	2019 Feb 6 (US) Notice of Allowance and Fees Due - App. 16/039,896 (007742.00112)
	17	2019 Mar 8 (US) Notice of Allowance and Fees Due - App. 16/060,374 (007742.00110)
	18	2019 Mar 11 (US) Final Office Action - App. 16/030,354 (007742.00114)
	19	2019 Feb 21 (US) Final Office Action - App. 15/382,806 (07742.00082)
	20	2019 Mar 8 (US) Notice of Allowance and Fees Due - App. 16/030,374 (007742.00110)
	21	2018 Aug 21 (US) Petition for Inter Partes Review of U.S. Patent No. 9,686,193 - IPR2018-01559
	22	2018 Aug 15 (US) Declaration of Staurt Staniford, PhD in Support of Petition for Inter Partes Review of U.S. Patent No. 9,686,193 - IPR2018-01556
	23	2019 Jan 24 (US) Decision - Institution of Inter Partes Review of U.S. Patent 9,160,713 B2 - IPR 2018-01437

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

	24	2019 Jan 24 (US) Decision - Institution of Inter Partes Review of U.S. Patent 9,124,552 B2 - IPR 2018-01436

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	A. N. M. Nguyen
	Attorney Docket Number	007742.00091\US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2019-03-27
Name/Print	Joshua D. Schneider	Registration Number	67,194

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
Wright, Bradley C.
BANNER AND WITCOFF, LTD
100 13th Street NW, Suite 1200
Washington DC 20005
ETATS-UNIS D'AMERIQUE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 007742.00115	Date of mailing *(day/month/year)* 4 September 2018 (04-09-2018) **FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US2018/041355	International filing date *(day/month/year)* 10 July 2018 (10-07-2018)
Applicant CENTRIPETAL NETWORKS, INC.	

1. [X] The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

   How? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Fasoimile No.: (41-22) 338.82.70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 - 9.011.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. [ ] **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   [ ] the protest together with the decision thereon has been transmitted to the International Bureau together with any applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

   [ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **22 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040 Fax: (+31-70) 340-3016	Authorized officer BARRIO BARANANO, Ainhoa Tel: +49 (0)89 2399-8621

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Form PCT/ISA/220 (July 2017)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
007742.00115		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2018/041355	10 July 2018 (10-07-2018)	10 July 2017 (10-07-2017)
Applicant		
CENTRIPETAL NETWORKS, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language,** the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [ ] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings,**
   a. the figure of the **drawings** to be published with the abstract is Figure No. 3
      [ ] as suggested by the applicant
      [X] as selected by this Authority, because the applicant failed to suggest a figure
      [ ] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/041355

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04L29/06
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/115621 A1 (STANIFORD STUART GRESLEY [US] ET AL) 6 May 2010 (2010-05-06)	1,10-13, 18
Y	abstract paragraph [0003] paragraph [0011] paragraph [0022] paragraph [0024] - paragraph [0027] paragraph [0029] - paragraph [0032] paragraph [0035] paragraph [0038] paragraph [0044] paragraph [0046] - paragraph [0047] paragraph [0050] - paragraph [0054] paragraph [0056] - paragraph [0058] paragraph [0061] - paragraph [0064] figures 1, 3 paragraph [0017]	2-9, 14-17, 19,20

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 August 2018	04/09/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Bharucha, Zubin

1

Form PCT/ISA/210 (second sheet) (April 2005)

Keysight, EX-1002
Page 173

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/041355

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 2016/028751 A1 (CRUZ MOTA JAVIER [CH] ET AL) 28 January 2016 (2016-01-28) paragraph [0017] paragraph [0023] - paragraph [0024] paragraph [0034] paragraph [0039] paragraph [0044] paragraph [0046] paragraph [0050] paragraph [0058] - paragraph [0059] paragraph [0068] figures 6, 10	2,4,5,8, 14,16,19 1,3,6,7, 9-13,15, 17,18,20
Y	Anonymous: "The Distribution of Malicious Domains", The DomainTools Report, 2016 Edition, 9 March 2016 (2016-03-09), pages 1-11, XP055502306, Retrieved from the Internet: URL:https://www.domaintools.com/resources/white-papers/the-domaintools-report-the-distribution-of-malicious-domains [retrieved on 2018-08-27] page 7 - page 8	6
Y A	US 2014/082730 A1 (VASHIST AKSHAY [US] ET AL) 20 March 2014 (2014-03-20) paragraph [0007] paragraph [0010] - paragraph [0011] paragraph [0014] - paragraph [0016] paragraph [0021] paragraph [0037] - paragraph [0042] paragraph [0049] paragraph [0051] - paragraph [0053] paragraph [0108] figure 3	3,7,9, 15,17,20 1,2,4-6, 8,10-14, 16,18,19

1

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

Keysight, EX-1002
Page 174

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2018/041355

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010115621 A1	06-05-2010	US 2010115621 A1	06-05-2010
		US 2013291109 A1	31-10-2013
		US 2015180886 A1	25-06-2015
US 2016028751 A1	28-01-2016	NONE	
US 2014082730 A1	20-03-2014	JP 6184270 B2	23-08-2017
		JP 2014060722 A	03-04-2014
		US 2014082730 A1	20-03-2014

Information on Search Strategy - Pilot phase (see OJ 2015, A86)
The type of information contained in this sheet may change during the pilot for improving the usefulness of this new service.

Application Number
PCT/US2018/041355

TITLE: CYBERANALYSIS WORKFLOW ACCELERATION

APPLICANT: CENTRIPETAL NETWORKS, INC.

IPC CLASSIFICATION: H04L29/06

EXAMINER: Bharucha, Zubin

CONSULTED DATABASES: WPI, NPL

CLASSIFICATION SYMBOLS DEFINING EXTENT OF THE SEARCH:

IPC:

CPC: H04L63/1416, H04L63/1441, H04L63/166

FI/F-TERMS:

KEYWORDS OR OTHER ELEMENTS FEATURING THE INVENTION:
Cyber analysis workflow acceleration, cyber threat intelligence (CTI) gateway, filter TCP/IP packet communication events, packet filtering, indicators, signatures, and behavioural patterns of network threats, log of threat event, cyberanalysis workflow application, tasks ordered by likelihood of reportable finding, investigate high likelihood events first, applying human-designed and machine learning algorithms to characteristics of events, heuristic algorithms, machine learning algorithms, event labelling as reportable or not, weighted results, security information and event management (SIEM) applications, second-level domain name, entropy of domain name

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2018/041355	10.07.2018	10.07.2017

International Patent Classification (IPC) or both national classification and IPC
INV. H04L29/06

Applicant
CENTRIPETAL NETWORKS, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

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Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	see form PCT/ISA/210	Bharucha, Zubin Telephone No. +49 89 2399-0

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-20
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-20
Industrial applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

1 **Re Item V**

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.1 Reference is made to the following documents:

D1 US 2010/115621 A1 (STANIFORD STUART GRESLEY [US] ET AL) 6 May 2010 (2010-05-06)

D2 US 2016/028751 A1 (CRUZ MOTA JAVIER [CH] ET AL) 28 January 2016 (2016-01-28)

D3 Anonymous: "The Distribution of Malicious Domains", The DomainTools Report, 2016 Edition, 9 March 2016 (2016-03-09), pages 1-11, XP055502306, Retrieved from the Internet: URL:https://www.domaintools.com/resources/white-papers/the-domaintools-report-the-distribution-of-malicious-domains [retrieved on 2018-08-27]

D4 US 2014/082730 A1 (VASHIST AKSHAY [US] ET AL) 20 March 2014 (2014-03-20)

1.2 The present application does not meet the criteria of Article 33(3) PCT, because the subject-matter of claim 1 does not involve an inventive step.

1.2.1 D1 is regarded as being the prior art closest to the subject-matter of claim 1, and discloses:

A method comprising:

receiving a plurality of event logs ***(figure 1; paragraphs [0017, 0029]) ["Network content may include any data transmitted over a network (i.e., network data).", "The heuristic module 130 receives the copy of the network data..."; the 'network content' of D1 corresponds to the 'plurality of event logs' of the present invention]***;

determining, by a computing device, a reportability likelihood for each event log based on at least one algorithm ***(figure 1; paragraphs [0029-0030]) ["...applies heuristics to the data to determine if the network data might contain suspicious network content ... the heuristic module 130 performs the heuristics and/or probability analysis."; the application of 'heuristics' to the data and the***

'probability analysis' of D1 correspond, respectively, to the 'algorithm' and to the 'reportability likelihood' of the present invention];

~~sorting~~ *<organizing>* an event queue of the plurality of event logs ***(figure 1; paragraph [0029]) ["The network data may then be buffered and organized into a data flow ... the suspicious network data is provided directly to the scheduler 140 without buffering or organizing the data flow."]*** ~~based on the reportability likelihood of each of the plurality of event logs~~; and

transmitting, by the computing device and to an analysis system, the plurality of event logs ~~sorted~~ *<organized>* in the event queue ***(figure 1; paragraph [0029]) ["The data flow may then be provided to the scheduler 140."; the 'scheduler' of D1 corresponds to the 'analysis system' of the present invention]*** ~~based on the reportability likelihood of each of the plurality of event logs~~.

1.2.2 The subject-matter of claim 1 therefore differs from this known method in that D1 fails to disclose that the event queue is sorted based on the reportability likelihood of each of the plurality of event logs and is therefore new.

1.2.3 The problem to be solved by the present invention may therefore be regarded as how to enable important security alerts to be efficiently treated.

1.2.4 The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) because D1 discloses that after determining network data containing suspicious content and prior to sending it to the "scheduler" for further treatment, the data may be organized ***(paragraph [0029])***. D1 goes on to disclose that probability analysis is performed in order to determine whether a data packet is malicious or not ***(paragraphs [0029-0030])***. Finally, D1 also discloses that a priority level may be assigned to each packet and that the scheduler may choose which feature to process first according to the priority levels provided ***(paragraphs [0061-0062])***. Thus, using these hints from D1, the act of sorting the event queue based on the reportability likelihood of each of the plurality of event logs, is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed in section 1.2.3.

1.3 The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claim 18, which therefore is also considered not inventive.

1.4 The present application does not meet the criteria of Article 33(3) PCT, because the subject-matter of claim 14 does not involve an inventive step.

1.4.1 D1 is regarded as being the prior art closest to the subject-matter of claim 14. The subject-matter of claim 14 corresponds to the subject-matter of claim 1 and has the additional features:

~~determining, by the computing device, a second reportability likelihood for each event log based on a machine-learned algorithm;~~

~~determining, by the computing device, a combined reportability likelihood for each event log based on the first reportability likelihood and the second reportability likelihood;~~

~~sorting~~ <*organizing*> the plurality of event logs ***(figure 1; paragraph [0029]) ["The network data may then be buffered and organized into a data flow ... the suspicious network data is provided directly to the scheduler 140 without buffering or organizing the data flow."]*** ~~based on the combined reportability likelihoods of each of the plurality of event logs~~; and

storing, in an event queue, the plurality of event logs sorted in the event queue ***(paragraph [0029]) ["The network data may then be buffered..."; the 'buffering' of D1 corresponds to the 'storing' of the present invention]*** ~~based on the combined reportability likelihood of each of the plurality of event logs~~.

1.4.2 The subject-matter of claim 1 therefore differs from this known method in that D1 fails to disclose that a combined reportability likelihood for each event log based on a first reportability likelihood and a second reportability likelihood is determined.

1.4.3 The problem to be solved by the present invention may therefore be regarded as how to enhance the reliability of the analysis results.

1.4.4 The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) because D1 discloses the application of heuristics to detect malicious network activity ***(paragraphs [0029-0030])***. D2 discloses that network traffic may be assigned multiple labels associated with probabilities ***(paragraph [0017]).*** D1 goes on

to disclose that a combined probability for two or more of the applied labels is determined ***(paragraph [0017])***. D2 also discloses that an applied label may also have an associated probability determined by machine learning ***(paragraph [0039])***. Using these teachings from D1 and D2, the skilled person would readily consider "reportability" as a label to which to attach a probability. Using this as a starting point, determining the combined reportability likelihood derived from two separate algorithms in order to arrive at a final reportability likelihood, is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the second partial objective technical problem posed in section 1.4.3.

1.5 Dependent claims 2-13, 15-17, 19 and 20 do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step. The additional technical features disclosed in these dependent claims are either known from or are common measures over the disclosures of D1-D4 (see the cited passages in the International Search Report).

D2 discloses that the probability of a label for the type of attack (corresponding to the 'type of event threat indicator' of the present invention) is determined ***(see, e.g., paragraph [0059])***.

D3 discloses that the entropy value of a domain name may be used as an indicator of whether it is malicious or not ***(pages 7-8)***.

D4 discloses the use of historical data and information about known attacks to computationally learn rules for detecting and predicting attacks ***(paragraph [0040])***.

2 **Re Item VII**

Certain defects in the international application

2.1 Independent claims 1, 14 and 18 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D1-D4 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

2.2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

2.3 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1-D4 is not mentioned in the description, nor are these documents identified therein.

3 **Re Item VIII**

Certain observations on the international application

3.1 The vague statement referring to the "scope and spirit" in ***paragraph [0073]*** of the description implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them.

3.2 Although independent claims 1 and 14 have been drafted as separate independent method claims, they appear to relate effectively to the same subject-matter and appear to have an overlapping scope with most features in common. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
Wright, Bradley C.
BANNER AND WITCOFF, LTD
100 13th Street NW, Suite 1200
Washington DC 20005
ETATS-UNIS D'AMERIQUE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 007742.00113	Date of mailing *(day/month/year)* 27 September 2018 (27-09-2018)
International application No. PCT/US2018/043367	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
Applicant CENTRIPETAL NETWORKS, INC.	International filing date *(day/month/year)* 24 July 2018 (24-07-2018)

1. [X] The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

   How? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Fascimile No.: (41-22) 338.82.70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 - 9.011.

2. [ ] The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. [ ] **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   [ ] the protest together with the decision thereon has been transmitted to the International Bureau together with any applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

   [ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

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   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **22 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040 Fax: (+31-70) 340-3016	Authorized officer PRIYANU, Pakpum T Tel: +49 (0)89 2399-4535

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Form PCT/ISA/220 (July 2017)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
007742.00113		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2018/043367	24 July 2018 (24-07-2018)	24 July 2017 (24-07-2017)
Applicant		
CENTRIPETAL NETWORKS, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language**, the international search was carried out on the basis of:
      [X] the international application in the language in which it was filed
      [ ] a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. [ ] This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. [ ] **Certain claims were found unsearchable** (See Box No. II)

3. [ ] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**
   [X] the text is approved as submitted by the applicant
   [ ] the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings,**
   a. the figure of the **drawings** to be published with the abstract is Figure No. 3
      [X] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [ ] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/043367

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04L29/06
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (otassification system followed by classification symbols)
H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, COMPENDEX, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2014/082204 A1 (SHANKAR HARI [US] ET AL) 20 March 2014 (2014-03-20) paragraphs [0012] - [0027]; figures 1-4	1-20
X	US 2014/337613 A1 (MARTINI PAUL MICHAEL [US]) 13 November 2014 (2014-11-13) paragraphs [0019] - [0041]; figures 1-3	1-20
A	"Examining SSL-encrypted Communications NetronomeSSLInspectorTM Transparent SSLProxy SolutionOverview", , 1 January 2008 (2008-01-01), XP055036015, Retrieved from the Internet: URL:http://www.infosecurityproductsguide.com/technology/2008/Netronome_Examining_SSL-encrypted_Communications.pdf [retrieved on 2012-08-21] the whole document	1-20

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 September 2018	27/09/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Schumann, Elena

3

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2018/043367

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014082204 A1	20-03-2014	NONE	
US 2014337613 A1	13-11-2014	CA 2912018 A1	13-11-2014
		EP 2995060 A2	16-03-2016
		US 2014337613 A1	13-11-2014
		US 2015215286 A1	30-07-2015
		US 2015381584 A1	31-12-2015
		US 2016197890 A1	07-07-2016
		WO 2014182727 A2	13-11-2014

Information on Search Strategy - Pilot phase (see OJ 2015, A86)
The type of information contained in this sheet may change during the pilot for improving the usefulness of this new service.

Application Number
PCT/US2018/043367

TITLE: EFFICIENT SSL/TLS PROXY

APPLICANT: CENTRIPETAL NETWORKS, INC.

IPC CLASSIFICATION: H04L29/06

EXAMINER: Schumann, Elena

CONSULTED DATABASES: COMPDX, DOSYS, EPODOC, INSPEC, NPL, WPI, XP3GPP, XPI3E, XPIETF

CLASSIFICATION SYMBOLS DEFINING EXTENT OF THE SEARCH:

IPC:

CPC: G06F21, H04L63, H04W12, H04L63/0281, H04L63/0236, H04L63/0272, H04L63/0464, H04L63/145, H04L63/166, H04L63/306

FI/F-TERMS:

KEYWORDS OR OTHER ELEMENTS FEATURING THE INVENTION:
KEYWORDS: SSL proxy, man-in-the-middle, intermediary, selective decryption, whitelist, blacklist, uri, url, fqdn, ip address, host name, domain name, protocol identifier, port, network address information, nai, dns, sni, server name indication, cn, common name, server certificate, law enforcement, wiretapping, legal interception

EPO FORM P04A42

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2018/043367	24.07.2018	24.07.2017

International Patent Classification (IPC) or both national classification and IPC
INV. H04L29/06

Applicant
CENTRIPETAL NETWORKS, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:	Date of completion of this opinion	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	see form PCT/ISA/210	Schumann, Elena Telephone No. +49 89 2399-0

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-20
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-20
Industrial applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 US 2014/082204 A1 20 March 2014

D2 US 2014/337613 A1 13 November 2014

1 The subject-matter of independent claims 1 and 11 is not novel with respect to the disclosure of document D1 (Art. 33(1) and 33(2) PCT), the reasons being as follows.

Document D1 discloses, in terms of independent claim 1 (references to D1 in parentheses) a method comprising:
generating, by a computing device, a list of identification data and a corresponding action to perform on encrypted communication flows associated with corresponding identification data (fig. 2 and par. 15: "...if the Domain Name System (DNS) server name for server 130 indicated in the certificate is "Bank A," proxy 120 determines...that TLS proxy services are not to be invoked for a connection established between client 110 and server 130, as shown at 205.", whereby said "list" with "identification data", corresponding to "DNS" and "corresponding action", corresponding to the proxy action associated with the DNS in the certificate, is implicitly generated, before its application as stated in par. 15);
receiving, by the computing device, one or more packets initiating (fig. 4, reference sign 401 "client hello") an encrypted communication flow (fig. 4, par. 23: "... proxy 120 determines whether or not TLS proxy services (proxy inspection/decryption) is to be applied to the communication session as shown at 404....", whereby the determination about "decryption" implies that the communication session is encrypted);
identifying, by the computing device, flow identification data associated with the encrypted communication flow;

comparing, by the computing device, the identified flow identification data with the list of the identification data (fig. 4, par. 23: "...Based upon the content of the server hello message 402 and the certificate message 403, such as the DNS server name and/or category of server 130..."); and
performing, by the computing device and based on the comparing, a corresponding action on the encrypted communication flow (fig. 4, reference sign 404, par. 23).

Since all features of claim 1 are known from document D1, the subject-matter of claim 1 is not novel (Article 33(2) PCT).

1.1 It is pointed out that the subject-matter of independent claim 1 is also not novel over the disclosure of document D2 (see in particular fig. 3, par. 29-41).

1.2 Independent claim 11 contains features corresponding to the ones of the method claim 1 in terms of an apparatus. Therefore the above arguments with respect to the lack of novelty of the subject-matter of claim 1 equally apply to said claim 11.

Consequently the subject-matter of claim 11 is also not novel (Article 33(2) PCT).

2 Dependent claims 2-10 and 12-20 do not contain any subject-matter which, in combination with the subject-matter of the claim on which they are dependent, would lead to a claim involving either novelty or inventive activity (Articles 33(2) and 33(3) PCT).

Their subject-matter is indeed either directly derivable from the above-cited documents (see the paragraphs cited in the international search report) or concerns simple embodiments without inventive merit in themselves.

Re Item VII

Certain defects in the international application

1 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

2 The relevant background art disclosed in the documents D1 and D2 is not mentioned in the description (Rule 5.1(a)(ii) PCT).

Re Item VIII

Certain observation/s on the international application

1 The expression "network addresses **and/or** domain names" in claim 2 leaves the reader in doubt, as to whether the mentioned features are essential for carrying out the invention or not. The same observation applies to several other claims.

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO/ISA)

General information

For all international applications, the competent International Searching Authority **(ISA)** will establish an international search report **(ISR)** accompanied by a written opinion of the International Searching Authority **(WO/ISA)**. The **WO/ISA** may be responded to by

- filing informal comments with the **International Bureau of WIPO (IB)** (where no demand for international preliminary examination **(demand)** is filed)
- filing amendments under Art. 19 PCT (this can be done whether or not a **demand** is filed)
- filing amendments under Art. 34 PCT and/or formal observations in response to objections raised in the **WO/ISA** (where a **demand** *is* actually filed)

This document explains these possibilities.

Filing informal comments

After receipt of the **ISR and WO/ISA**, the applicant may file informal comments on the **WO/ISA, directly with the IB** (see International Search and Preliminary Examination Guidelines 2.15). These will be communicated to the designated/elected Offices, together with the International Preliminary Report on Patentability **(IPRP)** at 30 months from the priority date.

Amending claims under Art. 19 PCT

The applicant may file **amended claims** under Art. 19 PCT, **directly with the IB** by the later of the following dates:

- 2 months from the date of mailing of the **ISR** and the **WO/ISA**
- 16 months from the priority date

However, any such amendment received by the **IB** after the expiration of the applicable time limit shall be **considered to have been received on time** by the **IB**, if it reaches it **before** the technical preparations for international publication have been completed (the 15th day prior to the date of publication, see PCT Applicant's Guide, International Phase, 9.013).

For further information, please see Rule 46 PCT as well as form PCT/ISA/220.

Please also note that, when filing amended claims under Art. 19 PCT, such amendments shall be **accompanied by a letter** identifying the amendments made and also the basis for the amendments in the application as originally filed (Rule 46.5(b) PCT). Where a **demand** is filed, failure to comply with this requirement may result in the amendments being ignored in the International Preliminary Examination Report **(IPER)**, see Rule 70.2(c-*bis*) PCT.

Filing a demand for international preliminary examination

In principle, the **WO/ISA** will be considered to be the written opinion of the International Preliminary Examining Authority (**IPEA**). Where the **WO/ISA** issued by the **EPO** as **ISA** gives a positive opinion on the international application and the invention to which it relates, filing a **demand** with the **EPO** as **IPEA** would normally be unnecessary, since a positive IPRP would anyway be established by the IB based on the WO/ISA (see also further below).

If the applicant wishes to file a **demand** (for example, to allow him to argue his case in international preliminary examination with regard to objections raised in a negative **WO/ISA** before the **IPEA** issues an **IPER**), this must be done before expiration of **3 months after the date of mailing of the ISR and WO/ISA** or **22 months after priority date**, whichever expires later (Rule 54*bis* PCT). Amendments under Art. 34 PCT can be filed with the IPEA, normally at the same time as filing the demand (Rule 66.1(b) PCT) or within the time limit set for reply to any written opinion issued during international preliminary examination by the **IPEA**.

If a **demand** is filed at the **EPO** as **IPEA** and no comments/amendments have been received by the time the **EPO** starts drawing up the **IPER** (Rule 66.4*bis* PCT), the **WO/ISA** will be transformed by the **IPEA** into an **IPER** (also called the **IPRP (Chapter II)** which would merely reflect the content of the **WO/ISA** (OJ 10/2011, 532). The **demand** can still be withdrawn (Art. 37 PCT).

Please also note that, when filing amendments under Art. 34 PCT, such amendments shall be accompanied by a letter which identifies the amendments made and also the basis for the amendments in the application as originally filed (Rule 66.8(a) PCT). Failure to comply with this requirement may result in the amendments being ignored in the **IPER (IPRP (Chapter II))**, see Rule 70.2(c-*bis*) PCT.

Filing a request for supplementary international search

The applicant may, with the **IB**, file a request for **supplementary international search** under Rule 45*bis*.1 PCT. The present **ISR** and **WO/ISA** may also be taken into account in the execution of that supplementary international search, provided that these are available to the Authority charged with this task before it starts the supplementary search (Rule 45*bis*.5 PCT).

This kind of request **cannot be filed specifying the ISA** who did the **international search**.

More information on this topic can be found in the **PCT Applicant's Guide**, Chapter 8 (http://www.wipo.int/pct/en/guide/ip08.html).

End of the international phase

Where no **demand** is filed, at the end of the international phase, the **IB** will transform the **WO/ISA** into the IPRP (PCT Chapter I) (Rule 44*bis* PCT), which will then be transmitted together with possible informal comments to the designated Offices. Where a demand is filed, the **WO/ISA** is not transformed into an **IPRP (Chapter I)** by the **IB**, but rather the **IPEA** will establish an **IPER**, (the IPER is the same as the IPRP (PCT Chapter II), see Rule 70.15 PCT).

DOCID: <XS_____20070401OCK_1_>

Bitte beachten Sie, dass angeführte Nichtpatentliteratur (wie z. B. wissenschaftliche oder technische Dokumente) je nach geltendem Recht dem Urheberrechtsschutz und/oder anderen Schutzarten für schriftliche Werke unterliegen könnte. Die Vervielfältigung urheberrechtlich geschützter Texte, ihre Verwendung in anderen elektronischen oder gedruckten Publikationen und ihre Weitergabe an Dritte ist ohne ausdrückliche Zustimmung des Rechtsinhabers nicht gestattet.

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XS CPRTENFRDE

BNSDOCID: <XS_____2006100103CF_I_>

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/039,896	07/19/2018	Sean Moore	007742.00112\US	3475

22907 7590 10/12/2018

BANNER & WITCOFF, LTD.
1100 13th STREET, N.W.
SUITE 1200
WASHINGTON, DC 20005-4051

DUE DATE

RESP TRACK1 OA
DUE: 1/12/19
FINAL:4/12/19

EXAMINER	
BROWN, ANTHONY D	

ART UNIT	PAPER NUMBER
2433	

NOTIFICATION DATE	DELIVERY MODE
10/12/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

GPD@bannerwitcoff.com
eofficeaction@bannerwitcoff.com

Office Action Summary	Application No. 16/039,896	Applicant(s) Moore, Sean	
	Examiner ANTHONY D BROWN	Art Unit 2433	AIA Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 7/19/2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-20 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 7/19/2018 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 7/25/18 (1)(2)(3); 8/8/18.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Allowable Subject Matter

Claims 7 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 7/25/18 was filed after the mailing date of the application on 7/19/2018. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

The information disclosure statement (IDS) submitted on 7/25/18 (2) was filed after the mailing date of the application on 7/19/2018. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

The information disclosure statement (IDS) submitted on 7/25/18 (3) was filed after the mailing date of the application on 7/19/2018. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

The information disclosure statement (IDS) submitted on 8/8/18 was filed after the mailing date of the application on 7/19/2018. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claimed invention is directed to non-statutory subject matter because the claim(s) as a whole, considering all claim elements both individually and in combination, do not amount to significantly more than an abstract idea. The claim(s) is/are directed to the abstract idea of efficient SSL/TLS proxy. All the steps of the claim, collectively as an ordered combination, correspond to collecting information, analyzing it, and displaying certain results of the collection and analysis (Electric Power Group) (which is an example of an abstract idea in the 2018 Interim Guidance on Patent Subject Matter Eligibility and the July 2018 Update). In the instant case, the claims are directed to only the manipulation of data as described above. The method steps themselves are considered to be an abstract idea because they do not purport to improve the functioning of the computer itself, there is no specific or limitation recitation of improved computer

technology, nor do they effect an improvement in any other technology or technical field. Hence the steps of the claim, taken individually or as an ordered combination, correspond to abstract ideas. The additional element(s) or combination of elements in the claim(s) other than the abstract idea per se amount(s) to no more than: *a generic computer to perform generic computer functions*. Viewed as a whole, these additional claim element(s) do not provide meaningful limitation(s) to transform the abstract idea into a patent eligible application of the abstract idea such that the claim(s) amounts to significantly more than the abstract idea itself. Therefore, the claim(s) are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter.

Claim Rejections - 35 USC § 102

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

Claim(s) 1-6, 8-16 and 18-20 are rejected under 35 U.S.C. 102 (a)(1) as being anticipated by Evevang (US Patent Pub. 20030088787).

As per claims 1 and 11: Egevang discloses a method comprising:

generating, by a computing device, a list of identification data and a corresponding action to perform on encrypted communication flows associated with corresponding identification data (**Paragraph 19; The SCAM may create the flow list by monitoring for a particular encrypted packet that designate the beginning of a flow**);

receiving, by the computing device, one or more packets initiating an encrypted communication flow (**Paragraph 33; An encrypted packet having an identifier and an external address that represents a plurality of internal addresses is received**);

identifying, by the computing device, flow identification data associated with the encrypted communication flow (**Paragraph 19; records an identifier for the ESP packet, along with a time stamp of when the ESP packet was received, as part of the flow list. An example of the identifier may be a security parameter index (SPI), which is used to assist in identifying an ESP packet**);

comparing, by the computing device, the identified flow identification data with the list of the identification data (**Paragraph 19; match an identifier for the external node ESP packet with an identifier for an ESP packet stored in the flow list**); and

performing, by the computing device and based on the comparing, a corresponding action on the encrypted communication flow (**Paragraph 19**).

As per claims 2 and 12: Egevang discloses the method of claim 1, wherein the generating the list of the identification data comprises:

receiving, by the computing device, a list of one or more network addresses and/or domain names from a security application (**Paragraph 13; The intermediate nodes may comprise nodes that communicate the information from the source node to the destination node. To assist in routing information between a source node, intermediate node(s) and a destination node, each node may be assigned a network address, such as an IP address**); and

creating the list of the identification data based on the received list of the one or more network addresses and/or domain names (**Paragraph 19; The SCAM may create the flow list by monitoring for a particular encrypted packet that designate the beginning of a flow**).

As per claims 3 and 13: Egevang discloses the method of claim 1, wherein the generating the list of the identification data comprises:

receiving, by the computing device and via a subscription service, at least one list of network addresses and/or domain names from one or more cyber threat intelligence providers (**Paragraph 13; The intermediate nodes may comprise nodes that communicate the information from the source node to the destination node. To assist in routing information between a source node, intermediate node(s) and a destination node, each node may be assigned a network address, such as an IP address**); and

creating the list of the identification data based on the received at least one list of network addresses and/or domain names (**Paragraph 19; The SCAM may create the flow list by monitoring for a particular encrypted packet that designate the beginning of a flow**).

As per claims 4 and 14: Egevang discloses the method of claim 1, wherein the generating the list of the identification data comprises:

receiving, by the computing device, a list of one or more network addresses and/or domain names from a privacy protection application (**Paragraph 13; The intermediate nodes may comprise nodes that communicate the information from the source node to the destination node. To assist in routing information between a source node, intermediate node(s) and a destination node, each node may be assigned a network address, such as an IP address**); and

creating the list of the identification data based on the received list of the one or more network addresses and/or domain names (**Paragraph 19; The SCAM may create the flow list by monitoring for a particular encrypted packet that designate the beginning of a flow**).

As per claims 5 and 15: Egevang discloses the method of claim 1, wherein the generating the list of the identification data comprises:

receiving, by the computing device, a list of one or more network addresses and/or domain names from a law-enforcement wiretapping application (**Paragraph 13; The intermediate nodes may comprise nodes that communicate the information from the source node to the destination node. To assist in routing information between a source node, intermediate node(s) and a destination node, each node may be assigned a network address, such as an IP address**); and

creating the list of the identification data based on the received list of the one or more network addresses and/or domain names (**Paragraph 19; The SCAM may create**

the flow list by monitoring for a particular encrypted packet that designate the beginning of a flow).

As per claims 6 and 16: Egevang discloses the method of claim 1, wherein the performing the corresponding action comprises: forwarding, by the computing device, a plurality of packets associated with a particular encrypted communication flow to their intended destinations, wherein the plurality of packets are not decrypted prior to the forwarding (**Paragraph 44; Communication module 306 may forward the ESP packet from network node 102 to network node 110 using the retrieved internal address. Afterwards, network node 106 may forward packets having the same SPI as the first ESP packet to the same internal address**).

As per claims 8 and 18: Egevang discloses the method of claim 1, wherein the list of the identification data indicates a particular action to perform on the identification data comprised by the list;

wherein the comparing the identified flow identification data with the list of the identification data determines that the list of the identification data does not comprise the identified flow identification data (**Paragraph 19; match an identifier for the external node ESP packet with an identifier for an ESP packet stored in the flow list**); and

wherein the performing the corresponding action comprises performing an action other than the particular action indicated by the list of the identification data (**Paragraph 19**).

As per claims 9 and 19: Egevang discloses the method of claim 8, wherein the action other than the particular action indicated by the list comprises terminating the encrypted

communication flow (**Paragraph 37-38; determine an activity level for each tunnel terminating at each device represented by the plurality of internal addresses**).

As per claims 10 and 20: Egevang discloses the method of claim 8, wherein the action other than the particular action indicated by the list comprises:

logging packets associated with the encrypted communication flow for subsequent analysis (**Paragraph 19; The SCAM then records an identifier for the ESP packet, along with a time stamp of when the ESP packet was received, as part of the flow list**); and

forwarding the packets associated with the encrypted communication flow to their respective intended destinations (**Paragraph 44; Communication module 306 may forward the ESP packet from network node 102 to network node 110 using the retrieved internal address. Afterwards, network node 106 may forward packets having the same SPI as the first ESP packet to the same internal address**).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY D BROWN whose telephone number is (571)270-1472. The examiner can normally be reached on 730-330pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Pwu can be reached on 571-272-6798. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ANTHONY D BROWN/
Primary Examiner, Art Unit 2433

Notice of References Cited	Application/Control No. 16/039,896	Applicant(s)/Patent Under Reexamination	
	Examiner ANTHONY D BROWN	Art Unit 2433	Page 1 of 1

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First Named Inventor	Sean Moore
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Attorney Docket Number	007742.00112\US

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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2018-07-25
Name/Print	Joshua D. Schneider	Registration Number	67,194

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16039896
Filing Date	2018-07-19
First Named Inventor	Sean Moore
Art Unit	~~N/A~~ 2433
Examiner Name	~~Not Yet Assigned~~ A.Brown
Attorney Docket Number	007742.00112\US

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	Attorney Docket Number	007742.00112\US

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EXAMINER SIGNATURE

Examiner Signature	/ANTHONY D BROWN/	Date Considered	10/09/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2018-07-25
Name/Print	Joshua D. Schneider	Registration Number	67,194

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Doc code: IDS
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Art Unit	~~N/A~~ 2433
Examiner Name	~~Not Yet Assigned~~ A.Brown
Attorney Docket Number	007742.00112\US

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	2	6147976	A	2000-11-14	Shand et al.	
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Application Number	16039896
Filing Date	2018-07-19
First Named Inventor	Sean Moore
Art Unit	N/A 2433
Examiner Name	Not Yet Assigned A.Brown
Attorney Docket Number	007742.00112\US

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	Attorney Docket Number	007742.00112\US

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EXAMINER SIGNATURE

Examiner Signature	/ANTHONY D BROWN/	Date Considered	10/09/2018

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CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2018-07-25
Name/Print	Joshua D. Schneider	Registration Number	67,194

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Art Unit	~~2491~~ 2433
Examiner Name	A.Brown
Attorney Docket Number	007742.00112\US

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	9419942	B1	2016-08-16	Buruganahalli et al.	
	2	7095716		2006-08-22	Ke et al.	
	3	9172627		2015-10-27	Kjendal et al.	

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20160366099	A1	2016-12-15	Jordan	
	2	20160065611	A1	2016-03-03	Fakeri-Tabrizi et al.	
	3	20160219065	A1	2016-07-28	Dasgupta et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.D.B/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16039896
	Filing Date	2018-07-19
	First Named Inventor	Sean Moore
	Art Unit	~~2491~~ 2433
	Examiner Name	A.Brown
	Attorney Docket Number	007742.00112\US

	4	20160285706	A1	2016-09-29	Rao	
	5	20160112443	A1	2016-04-21	Grossman et al.	
	6	20160020968	A1	2016-01-21	Aumann et al.	
	7	20090262741	A1	2009-10-22	Jungck et al.	
	8	20070118894	A1	2007-05-24	Bhatia	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	2018 Jul 27 (US) Non-Final Office Action - App. 15/382,806 (007742.00082)	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.D.B/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16039896
Filing Date	2018-07-19
First Named Inventor	Sean Moore
Art Unit	2491 2433
Examiner Name	A.Brown
Attorney Docket Number	007742.00112\US

	2	Sourcefire 3D System User Guide, Version 4.10, March 16, 2011, 2123 pages.	
	3	2018 Jul 11 (US) Declaration of Kevin Jeffay, PhD in Support of Petition for Inter Partes Review of U.S. Patent No. 9,565,213 - IPR2018-01386	
	4	Ylonen, et al, "The Secure Shell (SSH) Transport Layer Protocol," SSH Communication Security Corp, Network Working Group RFC 4253, January 2006, 32 pages.	
	5	2018 Jul 20 (US) Declaration of Dr. Stuart Staniford in Support of Petition for Inter Partes Review of U.S. Patent No. 9,160,713 - IPR2018-01437	
	6	2018 Jul 20 (US) Declaration of Dr. Stuart Staniford in Support of Petition for Inter Partes Review of U.S. Patent No. 9,124,552 - IPR2018-01436	
	7	2018 Jul 26 (US) Declaration of Kevin Jeffay, PhD in Support of Second Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01444	
	8	Nichols, et al, "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers," Network Working Group RFC 2474, December 1998, 20 pages.	
	9	2018 Jul 26 (US) Declaration of Kevin Jeffay, PhD in Support of First Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01443	
	10	Perkins, "IP Encapsulation with IP," Network Working Group RFC 2003, October 1996, 14 pages.	
	11	2018 Jul 12 (US) Petition for Inter Partes Review of U.S. Patent No. 9,565,213 - IPR2018-01386	
	12	2018 Jul 20 (US) Petition for Inter Partes Review of U.S. Patent No. 9,160,713 - IPR2018-01437	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16039896
Filing Date	2018-07-19
First Named Inventor	Sean Moore
Art Unit	~~2491~~ 2433
Examiner Name	A.Brown
Attorney Docket Number	007742.00112\US

	13	2018 Jul 20 (US) Petition for Inter Partes Review of U.S. Patent No. 9,124,552 - IPR2018-01436
	14	Blake, et al, "An Architechture for Differentiated Services," Network Working Group RFC 2475, December 1998, 36 pages.
	15	2018 Jul 27 (US) Second Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01444
	16	2018 Jul 27 (US) First Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01443

If you wish to add additional non-patent literature document citation information please click the Add button [Add]

EXAMINER SIGNATURE

Examiner Signature	/ANTHONY D BROWN/	Date Considered	10/09/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16039896
Filing Date	2018-07-19
First Named Inventor	Sean Moore
Art Unit	~~2491~~ 2433
Examiner Name	A.Brown
Attorney Docket Number	007742.00112\US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2018-08-08
Name/Print	Joshua D. Schneider	Registration Number	67,194

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.D.B/

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/614,956	Filing Date 06/06/2017	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $210 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	03/27/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/PEARLIE A FENNELL/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Docket No.: 007742.00091\US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Sean Moore

Application No.: 15/614,956 Confirmation No.: 9334

Filed: June 6, 2017 Art Unit: 2473

For: FILTERING NETWORK DATA TRANSFERS Examiner: A. N. M. Nguyen

AMENDMENT IN RESPONSE TO NON-FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.111

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

INTRODUCTORY COMMENTS

In response to the Office Action dated September 27, 2018, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 10 of this paper.

Applicant requests any necessary extension of time for the submission of this paper. If any fees are required or if an overpayment is made, the Commissioner is authorized to debit or credit our Deposit Account No. 19-0733, accordingly.

Electronic Patent Application Fee Transmittal

Application Number:	15614956
Filing Date:	06-Jun-2017
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Filer:	Joshua Daniel Schneider/Jennifer Brady
Attorney Docket Number:	007742.00091\US

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	2253	1	700	700
Miscellaneous:				
			Total in USD ($)	**700**

Electronic Acknowledgement Receipt

EFS ID:	35540729
Application Number:	15614956
International Application Number:	
Confirmation Number:	9334
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Customer Number:	22907
Filer:	Joshua Daniel Schneider/Jennifer Brady
Filer Authorized By:	Joshua Daniel Schneider
Attorney Docket Number:	007742.00091\US
Receipt Date:	27-MAR-2019
Filing Date:	06-JUN-2017
Time Stamp:	10:51:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$700
RAM confirmation Number	032719INTEFSW00009524190733
Deposit Account	190733
Authorized User	Jennifer Brady

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Amendment_in_Response_to_Non-Final_Office_Action_Under_37 CFR1_19678926.pdf	68072 433ae47ca99fde37fa6449f9734758d880b85ed4	yes	13

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Applicant Arguments/Remarks Made in an Amendment	10	13
	Claims	2	9
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30686 63668f6a231780a8188e1959f34f73a07795ac4d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	98758		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

REMARKS

The Office Action of September 27, 2018, has been carefully reviewed and these remarks are responsive thereto. Claims 1-4, 6-11, and 13-20 have been amended. No claims have been cancelled. Claims 1-20 thus remain pending in this application, with claims 1, 8, and 15 being independent. No new matter has been added. Reconsideration and allowance of the instant application are respectfully requested.

Nonstatutory Double Patenting

Claims 1-3, 6, 8, 13, and 15 stand rejected under the non-statutory judicially created doctrine of double patenting over claims 1-3, 16, 18, and 19 of U.S. Pat. No. 9,686,193.

Applicant acknowledges the non-statutory double patenting rejections and reserves the right to submit an appropriate terminal disclaimer, if the non-statutory double patenting rejections are maintained, upon indication that the application is otherwise in condition for allowance. Until such time, Applicant respectfully requests that the double patenting rejections of claims 2-21 be held in abeyance. Nevertheless, Applicant submits the rejection is moot in view of the foregoing amendments and requests reconsideration of the rejection.

Rejections Under 35 U.S.C. § 103

Claims 1-3, 5, 8-10, 12, and 15-17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2011/0055916[1] to Ahn in view of U.S. Patent Application Publication No. 2003/0005122 to Freimuth et al. (hereinafter Freimuth). Claims 4, 11, and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ahn, in view of Freimuth and further in view of U.S. Patent Application Publication No. 2008/0086435 to Chesla and U.S. Patent Application Publication No. 2002/0083345 to Halliday et al. (hereinafter Halliday). Claims 6, 13, and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over over Ahn, in view of Freimuth, and further in view of U.S. Patent Application Publication No. 2007/0291789 to

[1] It is noted that the Office Action includes a typographical error in citing Publication No. 2011/00559916, but the number is correctly identified in the PTO-892 Form attached to the Office Action.

Kutt et al (hereinafter Kutt). Claims 7, 14, and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ahn, in view of Freimuth and further in view of U.S. Patent Application Publication No. 2002/0186683 to Buck et al. (hereinafter Buck). Applicant respectfully traverses the rejections for at least the following reasons.

Amended claim 1 recites a method comprising, *inter alia*:

> determining, based on a packet header field value, whether each packet of the plurality of packets comprises data corresponding to first criterion specified by one or more packet-filtering rules;
>
> responsive to a determination by the computing system that a packet header field value of the first portion of packets comprises data corresponding to the first criterion specified by at least one matching packet-filtering rule, applying, by the computing system and to each packet in the first portion of packets, one or more operators specified by the at least one matching packet-filtering rule;
>
> determining, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule; and
>
> responsive to determining the second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, applying, by the computing system and to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to an prevent exfiltration operation.

Ahn discusses adaptive packet filtering, which may include filtering Internet protocol (IP) packets based on a combination of source and destination addresses in the IP headers of the packets. *See* paragraph [0016] of Ahn. A firewall rule is defined as an n-tuple criteria and an associated action for matching packets, such as, a 5-tuple rule that matches Internet Protocol version 4 (IPv4) packets might consist of 5 IPv4 header fields (source address, source port, destination address, destination port and protocol) and an action (allow, deny). *See* paragraph [0030] of Ahn.

The Office Action, on page 12, acknowledges certain of the deficiencies in the teachings of Ahn. For example, the Office Action acknowledges that Ahn fails to teach or suggest a determination based on an application header field value as previously recited in claim 1. The Office Action relies on Freimuth to address certain of the deficiencies in the teachings of Ahn.

Freimuth discusses providing admission control and service differentiation based on connection and application level information. *See* abstract of Freimuth. After the TCP handshake

completes and data is received to determine the HTTP header (204), the kernel classifies the request based on the header values (206). *See* paragraph [0029] of Freimuth. The data in the new established TCP connection (401) is parsed to detect the application header (402). *See* paragraph [0031] of Freimuth. The parsed header is then matched against the rule table to find a matching classification rule (403). *See* paragraph [0031] of Freimuth.

While Freimuth discusses application header-based service differentiation, Freimuth is not seen to teach or suggest processing packets comprising data corresponding to a first criterion specified by at least one matching packet-filtering rule. Rather, after the TCP handshake completes and data is received to determine the HTTP header (204), the kernel of Freimuth classifies the request based on the header values (206). *See* paragraph [0029] of Freimuth. In view of the forgoing, Applicant submits, however, that Freimuth, whether taken alone or in any permissible combination with Ahn, fails to teach or suggest "determining, based on an application header field value, the second portion of packets based on whether the first portion of packets comprises data corresponding to second criterion specified by one or more operators specified by the at least one matching packet-filtering rule" and "responsive to determining the second portion of packets that comprises data corresponding to the second criterion specified by one or more operators specified by the at least one matching packet-filtering rule, applying, by the computing system and to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to an prevent exfiltration operation" as recited in amended claim 1.

Independent claims 8 and 15, while not identical to claim 1, recite at least similar features as claim 1, and are therefore distinguishable over Ahn and Freimuth for at least similar reasons as those discussed above.

Each of dependent claims 2-9, 12-14, and 17-19 depends on one of independent claims 1, 11, and 16. Applicant submits that the remaining cited art fails to overcome the above-noted deficiencies. Therefore, the dependent claims are distinguishable over Ahn, Freimuth, Chesla, Halliday, Kutt, and Buck, whether taken alone or in any permissible combination, at least based on their respective dependencies from the allowable independent claims, and further in view of the additional features recited therein.

CONCLUSION

All issues having been addressed, Applicant respectfully submits that the instant application is in condition for allowance, and respectfully solicits prompt notification of the same. However, if for any reason the Examiner believes the application is not in condition for allowance or there are any questions, the Examiner is requested to contact the undersigned at (202) 824-3139.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Dated: March 27, 2019

Respectfully submitted,

By: /Joshua D. Schneider/
Joshua D. Schneider
Registration No.: 67,194

BANNER & WITCOFF, LTD.
1100 13th St. NW
STE 1200
Washington, DC 20005
(202) 824-3000

Listing of Claims:

This Listing of Claims will replace all prior versions and listings of claims in this application.

1. (Currently Amended) A method comprising:

receiving, by a computing system comprising memory and at least one processor, a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets, wherein the second portion of packets is a portion of the first portion of packets;

determining, based on a packet header field value, whether each packet of the plurality of packets comprises data corresponding to first criterion ~~criteria~~ specified by one or more packet-filtering rules;

responsive to a determination by the computing system that a packet header field value of the first portion of packets comprises data corresponding to the first criterion ~~criteria~~ specified by ~~the one or more~~ at least one matching packet-filtering rule~~rules configured to prevent a particular type of data transfer~~, applying, by the computing system and to each packet in the first portion of packets, one or more operators ~~a first operator,~~ specified by the ~~one or more packet-filtering rules, configured to drop packets associated with the particular type of data transfer~~ at least one matching packet-filtering rule;

determining, based on an application header field value, the second portion of packets based on whether the ~~second~~ first portion of packets comprises data corresponding to second criterion ~~criteria~~ specified by one or more operators specified by the ~~one or more packet-filtering rules~~at least one matching packet-filtering rule; and

responsive to determining ~~that~~ the second portion of packets that comprises data corresponding to the second criterion ~~criteria~~ specified by one or more operators specified by the at least one matching packet-filtering rule, applying, by the computing system and to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to an prevent exfiltration operation~~allow or block each packet in the second portion of packets from continuing toward its respective destination~~.

2. (Currently Amended) The method of claim 1, wherein:

the first portion of packets comprises a packet header field value indicating a protocol type associated with ~~the~~ a particular type of data transfer, and corresponding to the first criterion ~~criteria~~ specified by the at least one matching packet-filtering rule~~one or more packet-filtering rules; and~~

~~the second portion of packets comprises data indicating a protocol type not associated with the particular type of data transfer~~.

3. (Currently Amended) The method of claim 1, wherein:

the first portion of packets comprises data indicating a ~~first~~ destination port number associated with ~~the~~ a particular type of data transfer, and corresponding to the first criterion ~~criteria~~ specified by the at least one matching packet-filtering rule~~one or more packet-filtering rules; and~~

~~the second portion of packets comprises data indicating a second destination port number not associated with the particular type of data transfer~~.

4. (Currently Amended) The method of claim 1, wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets, and wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, the method further comprising:

allowing each packet of the third portion of packets to continue toward its respective destination; and

blocking each packet of the fourth portion of packets from continuing toward its respective destination.

5. (Previously Presented) The method of claim 1, the method further comprising:

allowing, based on a determination that the application header field value indicates a request for specified resource data, each packet of the second portion of packets indicating a request for specified resource data to continue toward its respective destination; and

blocking, based on a determination that the application header field value indicates a request to submit data to be processed by a specified resource, each packet of the second portion of packets indicating a request to submit data to be processed by the specified resource from continuing toward its respective destination.

6. (Currently Amended) The method of claim 1, ~~wherein applying the first operator configured to drop~~further comprising dropping packets associated with ~~the~~ a particular type of data transfer ~~is performed~~ responsive to a determination that the ~~first portion of~~ packets associated with the particular type of data transfer comprise ~~comprises~~ data corresponding to a particular transport layer security (TLS) version value.

7. (Currently Amended) The method of claim 1, further comprising dropping~~wherein applying the first operator configured to drop~~ packets associated with ~~the~~ a particular type of data transfer ~~is performed~~ responsive to a determination that the ~~first portion of~~ packets associated with the particular type of data transfer comprise ~~comprises~~ data corresponding to a particular real-time transport protocol value.

8. (Currently Amended) An apparatus comprising:

at least one processor; and

memory storing instructions that, when executed by the at least one processor, cause the apparatus to:

receive a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets, wherein the second portion of packets is a portion of the first portion of packets;

determine, based on a packet header field value, whether the plurality of packets comprises data corresponding to first criterion ~~criteria~~ specified by one or more packet-filtering rules;

responsive to a determination that a packet header field value of the first portion of packets comprises data corresponding to the first criterion ~~criteria~~ specified by ~~the one or more~~ at least one matching packet-filtering rule~~rules configured to prevent a particular type of data transfer~~, apply, to each packet in the first portion of packets, ~~a first operator,~~ one or

more operators specified by the ~~one or more packet filtering rules, configured to drop packets associated with the particular type of data transfer~~ at least one matching packet-filtering rule;

determine, based on an application header field value, the second portion of packets based on whether the ~~second~~ first portion of packets comprises data corresponding to second criterion ~~criteria~~ specified by one or more operators specified by the ~~one or more packet filtering rules~~at least one matching packet-filtering rule; and

responsive to determining ~~that~~ the second portion of packets that comprises data corresponding to the second criterion ~~criteria~~ specified by one or more operators specified by the at least one matching packet-filtering rule, apply, to each packet in the second portion of packets, at least one packet transformation function configured to ~~allow or block each packet in the second portion of packets from continuing toward its respective destination~~ prevent an exfiltration operation.

9. (Currently Amended) The apparatus of claim 8, wherein~~:~~

the first portion of packets comprises a packet header field value indicating a protocol type associated with ~~the~~ a particular type of data transfer, and corresponding to the first criterion ~~criteria~~ specified by the at least one matching packet-filtering rule~~one or more packet filtering rules; and~~

~~the second portion of packets comprises data indicating a protocol type not associated with the particular type of data transfer~~.

10. (Currently Amended) The apparatus of claim 8, wherein:

the first portion of packets comprises data indicating a ~~first~~ destination port number associated with ~~the~~ a particular type of data transfer, and corresponding to the first criterion ~~criteria~~ specified by the at least one matching packet-filtering rule~~one or more packet filtering rules; and~~

~~the second portion of packets comprises data indicating a second destination port number not associated with the particular type of data transfer~~.

11. (Currently Amended) The apparatus of claim 8, wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets, and wherein each packet of the third portion of packets ~~comprising~~ comprises at least one GET method value, and each packet of the fourth portion of packets ~~comprising~~ comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the at least one processor cause the apparatus to:

allow each packet of the third portion of packets to continue toward its respective destination; and

block each packet of the fourth portion of packets from continuing toward its respective destination.

12. (Previously Presented) The apparatus of claim 8, wherein the instructions, when executed by the one or more computing devices, cause the apparatus to:

allow, based on a determination that the application header field value indicates a request for data from a specified resource, each packet of the second portion of packets indicating a request for data from a specified resource to continue toward its respective destination; and

block, based on a determination that the application header field value indicates a request to submit data to be processed by a specified resource, each packet of the second portion of packets indicating a request to submit data to be processed by a specified from continuing toward its respective destination.

13. (Currently Amended) The apparatus of claim 8, wherein the instructions, when executed by the one or more computing devices, cause the apparatus ~~applying the first operator configured~~ to drop packets associated with ~~the~~ a particular type of data transfer ~~is performed~~ responsive to a determination that the ~~first portion of~~ packets associated with the particular type of data transfer comprise ~~comprises~~ data corresponding to a particular transport layer security (TLS) version value.

14. (Currently Amended) The apparatus of claim 8, wherein the instructions, when executed by the one or more computing devices, cause the apparatus ~~applying the first operator configured~~ to drop packets associated with ~~the~~ a particular type of data transfer ~~is performed~~ responsive to a determination that the ~~first portion of~~ packets associated with the particular type of data transfer comprise ~~comprises~~ data corresponding to a particular real-time transport protocol value.

15. (Currently Amended) One or more non-transitory computer-readable media comprising instructions that, when executed by one or more computing devices, cause the one or more computing devices to:

receive a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets, wherein the second portion of packets is a portion of the first portion of packets;

determine, based on a packet header field value, whether the plurality of packets comprises data corresponding to first criterion ~~criteria~~ specified by one or more packet-filtering rules;

responsive to a determination that a packet header field value of the first portion of packets comprises data corresponding to the first criterion ~~criteria~~ specified by ~~the one or more~~ at least one matching packet-filtering rule~~rules configured to prevent a particular type of data transfer~~, apply, to each packet in the first portion of packets, ~~a first operator,~~ one or more operators specified by the ~~one or more packet filtering rules, configured to drop packets associated with the particular type of data transfer~~ at least one matching packet-filtering rule;

determine, based on an application header field value, the second portion of packets based on whether the ~~second~~ first portion of packets comprises data corresponding to second criterion ~~criteria~~ specified by one or more operators specified by the ~~one or more packet filtering rules~~ at least one matching packet-filtering rule; and

responsive to determining ~~that~~ the second portion of packets that comprises data corresponding to the second criterion ~~criteria~~ specified by one or more operators specified by the at least one matching packet-filtering rule, apply, to each packet in the second portion of packets that match the second criterion, at least one packet transformation function configured to ~~allow or block each packet in the second portion of packets from continuing toward its respective destination~~ prevent an exfiltration operation.

16. (Currently Amended) The one or more non-transitory computer-readable media of claim 15, wherein:

the first portion of packets comprises a packet header field value indicating a protocol type associated with ~~the~~ a particular type of data transfer, and corresponding to the first criterion ~~criteria~~ specified by the at least one matching packet-filtering rule~~one or more packet-filtering rules; and~~

~~the second portion of packets comprises data indicating a protocol type not associated with the particular type of data transfer~~.

17. (Currently Amended) The one or more non-transitory computer-readable media of claim 15, wherein:

the first portion of packets comprises data indicating a ~~first~~ destination port number associated with ~~the~~ a particular type of data transfer, and corresponding to the first criterion ~~criteria~~ specified by the at least one matching packet-filtering rule~~one or more packet-filtering rules; and~~

~~the second portion of packets comprises data indicating a second destination port number not associated with the particular type of data transfer~~.

18. (Currently Amended) The one or more non-transitory computer-readable media of claim 15, wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprises a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets, and wherein each packet of the third portion of packets ~~comprising~~ comprises at least one GET method value, and each packet of the fourth portion of packets ~~comprising~~ comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the one or more computing devices, cause the one or more computing devices to:

allow each packet of the third portion of packets to continue toward its respective destination; and

block each packet of the fourth portion of packets from continuing toward its respective destination.

19. (Currently Amended) The one or more non-transitory computer-readable media of claim 15, ~~wherein applying the first operator configured to drop~~ further comprising dropping packets associated with ~~the~~ a particular type of data transfer ~~is performed~~ responsive to a determination that the ~~first portion of~~ packets associated with the particular type of data transfer comprises data corresponding to a particular transport layer security (TLS) version value.

20. (Currently Amended) The one or more non-transitory computer-readable media of claim 15, ~~wherein applying the first operator configured to drop~~ further comprising dropping packets associated with ~~the~~ a particular type of data transfer ~~is performed~~ responsive to a determination that the ~~first portion of~~ packets associated with the particular type of data transfer comprises data corresponding to a particular real-time transport protocol value.

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

GPD@bannerwitcoff.com
eofficeaction@bannerwitcoff.com

Office Action Summary	Application No. 15/614,956	Applicant(s) Moore, Sean	
	Examiner Anh Ngoc M Nguyen	Art Unit 2473	AIA Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 01/15/2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-20 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 06/06/2017 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 06/06/2017, 01/15/2018.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor

to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

Claims 1 – 3, 6, 8, 13, and 15 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1 – 3, 16, 18, and 19 of U.S. Patent No. 9,686,193. Although the claims at issue are not identical, they are not patentably distinct from each other because the conflicting claims are directed to the same inventive concept as shown below.

Dependent claims 4, 5, 7, 9 – 12, 14, and 16 – 20 of Application No. 15/614,956 are not disclosed by claims 1 – 3, 16, 18, and 19 of U.S. Patent No. 9,686,193; however, they are disclosed by the prior arts as shown below.

Claims from Application No. 15/614,956	**Claims from U.S. Patent No. 9,686,193**
1. A method comprising: receiving, by a computing system comprising memory and at least one processor, a plurality of packets,	1. A method comprising: receiving, by a computing system and from a computing device located in a first network, a plurality of

wherein the plurality of packets comprises a first portion of packets and a second portion of packets; determining, based on a packet header field value, whether each packet of the plurality of packets comprises data corresponding to criteria specified by one or more packet-filtering rules; responsive to a determination by the computing system that a packet header field value of the first portion of packets comprises data corresponding to criteria specified by the one or more packet-filtering rules configured to prevent a particular type of data transfer applying, by the computing system and to each packet in the first portion of packets, a first operator, specified by the one or more packet-filtering rules, configured to drop packets associated with the particular type of data transfer; determining, based on an application header field value, whether the second portion of packets comprises data corresponding to criteria specified by one or more operators specified by the one or more packet-filtering	packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets; responsive to a determination by the computing system that the first portion of packets comprises data corresponding to criteria specified by one or more packet-filtering rules configured to prevent a particular type of data transfer from the first network to a second network, wherein the data indicates that the first portion of packets is destined for the second network: applying, by the computing system and to each packet in the first portion of packets, a first operator, specified by the one or more packet-filtering rules, configured to drop packets associated with the particular type of data transfer; and dropping, by the computing system, each packet in first portion of packets; and responsive to a determination by the computing system that the second portion of packets comprises data that does not correspond to the criteria wherein the data indicates that the second portion of packets is

rules; and responsive to determining that the second portion of packets comprises data corresponding to the criteria specified by one or more operators, applying, by the computing system and to each packet in the second portion of packets, at least one packet transformation function configured to allow or block each packet in the second portion of packets from continuing toward its respective destination.	destined for a third network: applying, by the computing system and to each packet in the second portion of packets, and without applying the one or more packet-filtering rules configured to prevent the particular type of data transfer from the first network to the second network, a second operator configured to forward packets not associated with the particular type of data transfer toward the third network; and forwarding, by the computing system, each packet in the second portion of packets toward the third network.
2. The method of claim 1, wherein: the first portion of packets comprises a packet header field value indicating a protocol type associated with the particular type of data transfer, and corresponding to the criteria specified by the one or more packet-filtering rules; and the second portion of packets comprises data indicating a protocol type not associated with the particular type of data transfer.	2. The method of claim 1, wherein the first portion of packets comprises data indicating: a protocol type associated with the particular type of data transfer, and corresponding to the criteria specified by the one or more packet-filtering rules; and the second portion of packets comprises data indicating a protocol type not associated with the particular type of data transfer.

3. The method of claim 1, wherein: the first portion of packets comprises data indicating a first destination port number associated with the particular type of data transfer, and corresponding to the criteria specified by the one or more packet-filtering rules; and the second portion of packets comprises data indicating a second destination port number not associated with the particular type of data transfer.	3. The method of claim 1, wherein: the first portion of packets comprises data indicating a first destination port number associated with the particular type of data transfer, and corresponding to the criteria specified by the one or more packet-filtering rules; and the second portion of packets comprises data indicating a second destination port number not associated with the particular type of data transfer.
6. The method of claim 1, wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular transport layer security (TLS) version value.	16. The method of claim 1, wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination by the computing system that the first portion of packets comprises data corresponding to a particular transport layer security (TLS) version value.
8. An apparatus comprising: at least one processor; and memory storing instructions	18. A system comprising: at least one processor; and a memory storing instructions

that, when executed by the at least one processor, cause the apparatus to: receive a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets; determine, based on a packet header field value, whether the plurality of packets comprises data corresponding to criteria specified by one or more packet-filtering rules; responsive to a determination that a packet header field value of the first portion of packets comprises data corresponding to criteria specified by the one or more packet-filtering rules configured to prevent a particular type of data transfer, apply, to each packet in the first portion of packets, a first operator, specified by the one or more packet-filtering rules, configured to drop packets associated with the particular type of data transfer; determine, based on an application header field value, whether the second portion of packets comprises data corresponding to criteria specified by one or more operators specified by the one or more	that when executed by the at least one processor cause the system to: receive, from a computing device located in a first network, a plurality of packets wherein the plurality of packets comprises a first portion of packets and a second portion of packets; responsive to a determination that the first portion of packets comprises data corresponding to criteria specified by one or more packet-filtering rules configured to prevent a particular type of data transfer from the first network to a second network, wherein the data indicates that the first portion of packets is destined for the second network: apply, to each packet in the first portion of packets, a first operator, specified by the one or more packet-filtering rules, configured to drop packets associated with the particular type of data transfer; and drop each packet in the first portion of packets; and responsive to a determination that the second portion of packets comprises data that does not correspond to the criteria, wherein the data

packet-filtering rules; and responsive to determining that the second portion of packets comprises data corresponding to the criteria specified by one or more operators, apply, to each packet in the second portion of packets, at least one packet transformation function configured to allow or block each packet in the second portion of packets from continuing toward its respective destination.	indicates that the second portion of packets is destined for a third network: apply, to each packet in the second portion of packets, and without applying the one or more packet-filtering rules configured to prevent the particular type of data transfer from the first network to the second network, a second operator configured to forward packets not associated with the particular type of data transfer toward the third network; and forward each packet in the second portion of packets toward the third network.
13. The apparatus of claim 8, wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular transport layer security (TLS) version value.	16. The method of claim 1, wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination by the computing system that the first portion of packets comprises data corresponding to a particular transport layer security (TLS) version value.

15. One or more non-transitory computer-readable media comprising instructions that, when executed by one or more computing devices, cause the one or more computing devices to: receive a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets; determine, based on a packet header field value, whether the plurality of packets comprises data corresponding to criteria specified by one or more packet-filtering rules; responsive to a determination that a packet header field value of the first portion of packets comprises data corresponding to criteria specified by the one or more packet-filtering rules configured to prevent a particular type of data transfer, apply, to each packet in the first portion of packets, a first operator, specified by the one or more packet-filtering rules, configured to drop packets associated with the particular type of data transfer; determine, based on an application header field value, whether the	19. One or more non-transitory computer-readable media comprising instructions that when executed by one or more computing devices cause the one or more computing devices to: receive, from a computing device located in a first network, a plurality of packets wherein the plurality of packets comprises a first portion of packets and a second portion of packets; responsive to a determination that the first portion of packets comprises data corresponding to criteria specified by one or more packet-filtering rules configured to prevent a particular type of data transfer from the first network to a second network, wherein the data indicates that the first portion of packets is destined for the second network: apply, to each packet in the first portion of packets, a first operator, specified by the one or more packet-filtering rules, configured to drop packets associated with the particular type of data transfer; and drop each packet in the first portion of packets; and responsive to a determination

second portion of packets comprises data corresponding to criteria specified by one or more operators specified by the one or more packet-filtering rules; and responsive to determining that the second portion of packets comprises data corresponding to the criteria specified by one or more operators, apply, to each packet in the second portion of packets, at least one packet transformation function configured to allow or block each packet in the second portion of packets from continuing toward its respective destination.	that the second portion of packets comprises data that does not correspond to the criteria, wherein the data indicates that the second portion of packets is destined for a third network: apply, to each packet in the second portion of packets, and without applying the one or more packet-filtering rules configured to prevent the particular type of data transfer from the first network to the second network, a second operator, configured to forward packets not associated with the particular type of data transfer toward the third network; and forward each packet in the second portion of packets toward the third network.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 3, 5, 8 – 10, 12, and 15 – 17 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ahn (US Pub. No. 2011/00559916) in view of Freimuth et al. (US Pub. No. 2003/0005122).

Regarding claim 1, Ahn discloses a method comprising: receiving, by a computing system comprising memory and at least one processor (see Fig. 2, a firewall 200 with a processor 204 and packet filter 108 coupled to rule subset 208), a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets (see Fig. 2, para. 0009, 0021, a network firewall for receiving packets…); determining, based on a packet header field value (see para. 0017, 0030, compares traffic data (i.e., packets) such as header fields to a set of one or more rules…), whether each packet of the plurality of packets comprises data corresponding to criteria specified by one or more packet-filtering rules; responsive to a determination by the computing system that a packet header field value of the first portion of packets comprises data corresponding to criteria specified by the one or more packet-filtering rules configured to prevent a particular type of data transfer (see para. 0007, packets are filtered

at the firewall using sorted rules in the subset by using binary search...to compare each packet to the sorted rules in the subset until the packet is allowed or denied...); applying, by the computing system and to each packet in the first portion of packets, a first operator, specified by the one or more packet-filtering rules, configured to drop packets associated with the particular type of data transfer (see Fig. 2, Fig. 4, note the denied packets (discard), para. 0016, 0020, 0030 – 0031, packets that traverse the firewall are checked against each rule in the rule set until the first matching rule is found and its associated action is applied…such as action DENY).

Ahn discloses the claimed limitations as stated above. However, Ahn does not specifically disclose the following features: regarding claim 1,determining, based on an application header field value, whether the second portion of packets comprises data corresponding to criteria specified by one or more operators specified by the one or more packet-filtering rules; and responsive to determining that the second portion of packets comprises data corresponding to the criteria specified by one or more operators, applying, by the computing system and to each packet in the second portion of packets, at least one packet transformation function configured to allow or block each packet in the second portion of packets from continuing toward its respective destination.

Regarding claim 1, Freimuth discloses determining, based on an application header field value, whether the second portion of packets comprises data corresponding to criteria specified by one or more operators specified by the one or more packet-filtering rules (see Fig. 2, action rules: drop, rate control, schedule order, monitor, etc…); and responsive to determining that the second portion of packets comprises data corresponding to the criteria specified by one or more operators, applying, by the computing system and to each packet in the second portion of packets, at least one packet transformation function configured to allow or block each packet in

the second portion of packets from continuing toward its respective destination (see Fig. 2, para. 0029, 0031, 0033, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule may be to drop or to perform schedule order…).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn, and have the features, as taught by Freimuth, in order to protect Web servers against overload by controlling the amount and rate of work entering the systems, as discussed by Freimuth (abstract).

Regarding claim 2, Ahn discloses wherein: the first portion of packets comprises a packet header field value (see para. 0030, packets with header fields) indicating a protocol type associated with the particular type of data transfer, and corresponding to the criteria specified by the one or more packet-filtering rules (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a protocol type of TCP or UDP); and the second portion of packets comprises data indicating a protocol type not associated with the particular type of data transfer (see para. 0030 – 0031, for example, in rules R4 and R5 where a packet corresponds to a protocol type of ANY).

Regarding claim 3, Ahn discloses wherein: the first portion of packets comprises data indicating a first destination port number associated with the particular type of data transfer, and corresponding to the criteria specified by the one or more packet-filtering rules (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a destination port of 80, 25, or 53…); and the second portion of packets comprises data indicating a second destination port number not associated with the particular type of data transfer (see para. 0030 –

0031, for example, in rules R4 and R5 where a packet may correspond to ANY destination port…).

Regarding claim 5, Freimuth discloses the method further comprising: allowing, based on a determination that the application header field value indicates a request for specified resource data, each packet of the second portion of packets indicating a request for specified resource data to continue toward its respective destination (see Fig. 2, action rules: schedule order, para. 0033, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule is to perform schedule ordering and establish a connection…); and blocking, based on a determination that the application header field value indicates a request to submit data to be processed by a specified resource, each packet of the second portion of packets indicating a request to submit data to be processed by the specified resource from continuing toward its respective destination (see Fig. 2, para. 0029, 0031, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule is to drop the connection).

Regarding claim 8, Ahn discloses an apparatus comprising: at least one processor; and memory storing instructions that, when executed by the at least one processor, cause the apparatus (see Fig. 2, a firewall 200 with a processor 204 and packet filter 108 coupled to rule subset 208) to: receive a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets (see Fig. 2, para. 0009, 0021, a network firewall for receiving packets…); determine, based on a packet header field value (see para. 0017, 0030, compares traffic data (i.e., packets) such as header fields to a set of one or more rules…), whether the plurality of packets comprises data corresponding to criteria specified by

one or more packet-filtering rules; responsive to a determination that a packet header field value of the first portion of packets comprises data corresponding to criteria specified by the one or more packet-filtering rules configured to prevent a particular type of data transfer (see para. 0007, packets are filtered at the firewall using sorted rules in the subset by using binary search...to compare each packet to the sorted rules in the subset until the packet is allowed or denied...), apply, to each packet in the first portion of packets, a first operator, specified by the one or more packet-filtering rules, configured to drop packets associated with the particular type of data transfer (see Fig. 2, Fig. 4, note the denied packets (discard), para. 0016, 0020, 0030 – 0031, packets that traverse the firewall are checked against each rule in the rule set until the first matching rule is found and its associated action is applied…such as action DENY).

Ahn discloses the claimed limitations as stated above. However, Ahn does not specifically disclose the following features: regarding claim 8, determine, based on an application header field value, whether the second portion of packets comprises data corresponding to criteria specified by one or more operators specified by the one or more packet-filtering rules; and responsive to determining that the second portion of packets comprises data corresponding to the criteria specified by one or more operators, apply, to each packet in the second portion of packets, at least one packet transformation function configured to allow or block each packet in the second portion of packets from continuing toward its respective destination.

Regarding claim 8, Freimuth discloses determine, based on an application header field value (see Fig. 2, action rules: drop, rate control, schedule order, monitor, etc…), whether the second portion of packets comprises data corresponding to criteria specified by one or more operators specified by the one or more packet-filtering rules; and responsive to determining that

the second portion of packets comprises data corresponding to the criteria specified by one or more operators, apply, to each packet in the second portion of packets, at least one packet transformation function configured to allow or block each packet in the second portion of packets from continuing toward its respective destination (see Fig. 2, para. 0029, 0031, 0033, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule may be to drop or to perform schedule order…).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn, and have the features, as taught by Freimuth, in order to protect Web servers against overload by controlling the amount and rate of work entering the systems, as discussed by Freimuth (abstract).

Regarding claim 9, Ahn discloses wherein: the first portion of packets comprises a packet header field value (see para. 0030, packets with header fields) indicating a protocol type associated with the particular type of data transfer, and corresponding to the criteria specified by the one or more packet-filtering rules (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a protocol type of TCP or UDP); and the second portion of packets comprises data indicating a protocol type not associated with the particular type of data transfer (see para. 0030 – 0031, for example, in rules R4 and R5 where a packet corresponds to a protocol type of ANY).

Regarding claim 10, Ahn discloses wherein: the first portion of packets comprises data indicating a first destination port number associated with the particular type of data transfer, and corresponding to the criteria specified by the one or more packet-filtering rules (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a destination port of

80, 25, or 53…); and the second portion of packets comprises data indicating a second destination port number not associated with the particular type of data transfer (see para. 0030 – 0031, for example, in rules R4 and R5 where a packet may correspond to ANY destination port…).

Regarding claim 12, Freimuth discloses wherein the instructions, when executed by the one or more computing devices, cause the apparatus to: allow, based on a determination that the application header field value indicates a request for data from a specified resource, each packet of the second portion of packets indicating a request for data from a specified resource to continue toward its respective destination (see Fig. 2, action rules: schedule order, para. 0033, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule is to perform schedule ordering and establish a connection…); and block, based on a determination that the application header field value indicates a request to submit data to be processed by a specified resource, each packet of the second portion of packets indicating a request to submit data to be processed by a specified from continuing toward its respective destination (see Fig. 2, para. 0029, 0031, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule is to drop the connection).

Regarding claim 15, Ahn discloses one or more non-transitory computer-readable media comprising instructions that, when executed by one or more computing devices, cause the one or more computing devices to (see Fig. 2, a firewall 200 with a processor 204 and packet filter 108 coupled to rule subset 208): receive a plurality of packets, wherein the plurality of packets comprises a first portion of packets and a second portion of packets (see Fig. 2, para. 0009, 0021, a network firewall for receiving packets…); determine, based on a packet header field value (see

para. 0017, 0030, compares traffic data (i.e., packets) such as header fields to a set of one or more rules…), whether the plurality of packets comprises data corresponding to criteria specified by one or more packet-filtering rules; responsive to a determination that a packet header field value of the first portion of packets comprises data corresponding to criteria specified by the one or more packet-filtering rules configured to prevent a particular type of data transfer (see para. 0007, packets are filtered at the firewall using sorted rules in the subset by using binary search...to compare each packet to the sorted rules in the subset until the packet is allowed or denied...), apply, to each packet in the first portion of packets, a first operator, specified by the one or more packet-filtering rules, configured to drop packets associated with the particular type of data transfer (see Fig. 2, Fig. 4, note the denied packets (discard), para. 0016, 0020, 0030 – 0031, packets that traverse the firewall are checked against each rule in the rule set until the first matching rule is found and its associated action is applied…such as action DENY).

Ahn discloses the claimed limitations as stated above. However, Ahn does not specifically disclose the following features: regarding 15, determine, based on an application header field value, whether the second portion of packets comprises data corresponding to criteria specified by one or more operators specified by the one or more packet-filtering rules; and responsive to determining that the second portion of packets comprises data corresponding to the criteria specified by one or more operators, apply, to each packet in the second portion of packets, at least one packet transformation function configured to allow or block each packet in the second portion of packets from continuing toward its respective destination.

Regarding 15, Freimuth discloses determine, based on an application header field value (see Fig. 2, action rules: drop, rate control, schedule order, monitor, etc…), whether the second portion of packets comprises data corresponding to criteria specified by one or more operators

specified by the one or more packet-filtering rules; and responsive to determining that the second portion of packets comprises data corresponding to the criteria specified by one or more operators, apply, to each packet in the second portion of packets, at least one packet transformation function configured to allow or block each packet in the second portion of packets from continuing toward its respective destination (see Fig. 2, para. 0029, 0031, 0033, parsing to detect the application header…the parsed header is then matched against the rule table to find a matching classification rule…and the associated action rule may be to drop or to perform schedule order…).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn, and have the features, as taught by Freimuth, in order to protect Web servers against overload by controlling the amount and rate of work entering the systems, as discussed by Freimuth (abstract).

Regarding claim 16, Ahn discloses wherein: the first portion of packets comprises a packet header field value (see para. 0030, packets with header fields) indicating a protocol type associated with the particular type of data transfer, and corresponding to the criteria specified by the one or more packet-filtering rules (see para. 0030 – 0031, for example, in rules R1, R2, and R3 where a packet corresponds to a protocol type of TCP or UDP); and the second portion of packets comprises data indicating a protocol type not associated with the particular type of data transfer (see para. 0030 – 0031, for example, in rules R4 and R5 where a packet corresponds to a protocol type of ANY).

Regarding claim 17, Ahn discloses wherein: the first portion of packets comprises data indicating a first destination port number associated with the particular type of data transfer, and corresponding to the criteria specified by the one or more packet-filtering rules (see para. 0030 –

0031, for example, in rules R1, R2, and R3 where a packet corresponds to a destination port of 80, 25, or 53…); and the second portion of packets comprises data indicating a second destination port number not associated with the particular type of data transfer (see para. 0030 – 0031, for example, in rules R4 and R5 where a packet may correspond to ANY destination port…).

Claims 4, 11, and 18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ahn (US Pub. No. 2011/00559916) in view of Freimuth et al. (US Pub. No. 2003/0005122) and further in view of Chesla et al. (US Pub. No. 2008/0086435) and Halliday et al. (US Pub. No. 2002/0083345).

Regarding claim 4, Freimuth discloses wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprise a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets (see para. 0021 – 0028, parsing the HTTP header of packets…).

Regarding claim 11, Freimuth discloses wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprise a plurality of HTTP packets, wherein the second portion of packets comprises a third portion of packets and a fourth portion of packets (see para. 0021 – 0028, parsing the HTTP header of packets…).

Regarding claim 18, Freimuth discloses wherein the application header field value identifies one or more hypertext transfer protocol (HTTP) methods, wherein the second portion of packets comprise a plurality of HTTP packets, wherein the second portion of packets

comprises a third portion of packets and a fourth portion of packets (see para. 0021 – 0028, parsing the HTTP header of packets…).

Ahn and Freimuth do not disclose the following features: regarding claim 4, wherein each packet of the third portion of packets comprises at least one GET method value, and each packet of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, the method further comprising: allowing each packet of the third portion of packets to continue toward its respective destination; and blocking each packet of the fourth portion of packets from continuing toward its respective destination; regarding claim 11, wherein each packet of the third portion of packets comprising at least one GET method value, and each packet of the fourth portion of packets comprising at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the at least one processor cause the apparatus to: allow each packet of the third portion of packets to continue toward its respective destination; and block each packet of the fourth portion of packets from continuing toward its respective destination; regarding claim 18, wherein each packet of the third portion of packets comprising at least one GET method value, and each packet of the fourth portion of packets comprising at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the one or more computing devices, cause the one or more computing devices to: allow each packet of the third portion of packets to continue toward its respective destination; and block each packet of the fourth portion of packets from continuing toward its respective destination.

Regarding claim 4, the combination of Chesla and Halliday discloses wherein each packet of the third portion of packets comprises at least one GET method value, and each packet

of the fourth portion of packets comprises at least one of a PUT method value, a POST method value, or a CONNECT method value, the method further comprising: allowing each packet of the third portion of packets to continue toward its respective destination (see Chesla: para. 0407, 0412, block HTTP request that is not GET…hence GET is allowed to pass); and blocking each packet of the fourth portion of packets from continuing toward its respective destination (see Halliday: para. 0010, denying HTTP POST request…).

Regarding claim 11, the combination of Chesla and Halliday discloses wherein each packet of the third portion of packets comprising at least one GET method value, and each packet of the fourth portion of packets comprising at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the at least one processor cause the apparatus to: allow each packet of the third portion of packets to continue toward its respective destination (see Chesla: para. 0407, 0412, block HTTP request that is not GET…hence GET is allowed to pass); and block each packet of the fourth portion of packets from continuing toward its respective destination (see Halliday: para. 0010, denying HTTP POST request…).

Regarding claim 18, the combination of Chesla and Halliday discloses wherein each packet of the third portion of packets comprising at least one GET method value, and each packet of the fourth portion of packets comprising at least one of a PUT method value, a POST method value, or a CONNECT method value, and wherein the instructions, when executed by the one or more computing devices, cause the one or more computing devices to: allow each packet of the third portion of packets to continue toward its respective destination (see Chesla: para. 0407, 0412, block HTTP request that is not GET…hence GET is allowed to pass); and

block each packet of the fourth portion of packets from continuing toward its respective destination (see Halliday: para. 0010, denying HTTP POST request…).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn and Freimuth, and have the features, as taught by the combination of Chesla and Halliday, in order to mitigate the attack effectively while letting legitimate traffic to pass, as discussed by Chesla (abstract) and in order to provide protection to a communication by a firewall, as discussed by Halliday (para. 0003).

Claims 6, 13, and 19 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ahn (US Pub. No. 2011/00559916) in view of Freimuth et al. (US Pub. No. 2003/0005122) and further in view of Kutt et al. (US Pub. No. 2007/0291789).

Ahn and Freimuth do not disclose the following features: regarding claim 6, wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular transport layer security (TLS) version value; regarding claim 13, wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular transport layer security (TLS) version value; regarding claim 19, wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular transport layer security (TLS) version value.

Regarding claim 6, Kutt discloses wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular transport layer security (TLS) version value (see para. 0007, the detection and blocking of HTTP messages may be done by third parties or firewalls where HTTP messages are encrypted by using a version of transport layer security (TLS) protocol).

Regarding claim 13, Kutt discloses wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular transport layer security (TLS) version value (see para. 0007, the detection and blocking of HTTP messages may be done by third parties or firewalls where HTTP messages are encrypted by using a version of transport layer security (TLS) protocol).

Regarding claim 19, Kutt discloses wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular transport layer security (TLS) version value (see para. 0007, the detection and blocking of HTTP messages may be done by third parties or firewalls where HTTP messages are encrypted by using a version of transport layer security (TLS) protocol).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn and Freimuth, and have the features, as taught by Kutt, in order to have a significant benefit in reducing the number of system entities that are exposed to sensitive information, as discussed by Kutt (para. 0036).

Claims 7, 14, and 20 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Ahn (US Pub. No. 2011/00559916) in view of Freimuth et al. (US Pub. No. 2003/0005122) and further in view of Buck et al. (US Pub. No. 2002/0186683).

Ahn and Freimuth do not disclose the following features: regarding claim 7, wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular real-time transport protocol value; regarding claim 14, wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular real-time transport protocol value; regarding claim 20, wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular real-time transport protocol value.

Regarding claim 7, Buck discloses wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular real-time transport protocol value (see para. 0050, 0056, that all UDP (or RTP) packet transfers are blocked by the firewall 20).

Regarding claim 14, Buck discloses wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular real-time transport protocol value (see para. 0050, 0056, that all UDP (or RTP) packet transfers are blocked by the firewall 20).

Regarding claim 20, Buck discloses wherein applying the first operator configured to drop packets associated with the particular type of data transfer is performed responsive to a determination that the first portion of packets comprises data corresponding to a particular real-time transport protocol value (see para. 0050, 0056, that all UDP (or RTP) packet transfers are blocked by the firewall 20).

It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the invention of Ahn and Freimuth, and have the features, as taught by Buck, in order to utilize a computer device that is protected by a firewall security system that does not allow transmissions of voice data using connectionless packet protocol over the firewall or reception of voice data over the Internet from the unknown (non-secure) third parties, as discussed by Buck (para. 0009).

Conclusion

Examiner's Note: Examiner has cited particular paragraphs, columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and, also to verify and ascertain the metes and bounds of the Claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh Ngoc M Nguyen whose telephone number is (571)270-5139. The examiner can normally be reached on Monday to Friday, from 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Bin Yao can be reached on ((571)272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice .

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/ANH NGOC M NGUYEN/
Primary Examiner, Art Unit 2473

Notice of References Cited	Application/Control No. 15/614,956	Applicant(s)/Patent Under Reexamination Moore, Sean	
	Examiner Anh Ngoc M Nguyen	Art Unit 2473	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20110055916-A1	03-2011	Ahn; David K.	H04L63/0227	726/13
*	B	US-20030005122-A1	01-2003	Freimuth, Douglas Morgan	H04L29/06	709/225
*	C	US-20070291789-A1	12-2007	Kutt; Andres	G06Q30/00	370/467
*	D	US-20020083345-A1	06-2002	Halliday, David C.	H04L63/0209	726/14
*	E	US-20080086435-A1	04-2008	Chesla; Avi	H04L63/1458	706/12
*	F	US-20020186683-A1	12-2002	Buck, Alan	H04L63/029	370/352
*	G	US-9686193-B2	06-2017	Moore; Sean	H04L63/0263	1/1
	H					
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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/614,956	Moore, Sean
	Examiner	Art Unit
	Anh Ngoc M Nguyen	2473

CPC - Searched*		
Symbol	Date	Examiner
h04l45/74 -- see search history	09/19/2018	AN

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
searched for double patenting; inventors; assignee; EAST database, subgroups combined with texts search for invention	09/19/2018	AN

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/614,956	Moore, Sean
	Examiner	Art Unit
	Anh Ngoc M Nguyen	2473

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/24/2018								
	1	✓								
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15/614,956	06/06/2017	370	2473	007742.00091\US

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**** CONTINUING DATA ***************************
This application is a CON of 14/625,486 02/18/2015 PAT 9686193
which is a CON of 13/795,822 03/12/2013 PAT 9124552

**** FOREIGN APPLICATIONS ***************************

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Foreign Priority claimed ❑ Yes ☑ No 35 USC 119(a-d) conditions met ❑ Yes ☑ No Verified and Acknowledged /ANH NGOC M NGUYEN/ Examiner's Signature	❑ Met after Allowance AN Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15614956
Filing Date	2017-06-06
First Named Inventor	Sean Moore
Art Unit	2473
Examiner Name	K. B. Yao
Attorney Docket Number	007742.00091\US

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7814546	B1	2010-10-12	Strayer et al.	

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	1	20040123220	A1	2004-06-24	Johnson et al.	

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	1	2017 Sep 5 (US) Memorandum in Support of Defendant's Ixia and Keysight Techonologies, Inc's Motion to Dismiss for Unpatentability Under 35 U.S.C. § 101 - Case No. 2:17-cv-00383-HCM-LRL, Document 21, 29 pages.	
	2	2017 Sep 5 (US) Request for Judicial Notice in Support of Defendants Ixia and Keysight Technologies, Inc's Motion to Dismiss for Unpatentability under 35 U.S.C. § 101 - Case No. 2:17-cv-00383-HCN-LRL, Document 22, 3 pages.	
	3	2017 Jul 20 (US) Complaint for Patent Infringement - Case No. 2:17-cv-00383-HCN-LRL, Document 1, 38 pages.	
	4	2017 Sep 5 (US) Defendant Ixia's Partial Answer to Complaint for Patent Infringement - Case No. 2:17-cv-00383-HCN-LRL, Document 29, 14 pages.	
	5	2018 Mar 8 (US) Non-Final Office Action - App. 14/745,207	
	6	2018 Mar 16 (EP) Communication Pursuant to Rule 164(2)(b) and Aritcle 94(3) EPC - App. 15722292.8	
	7	2018 Mar 15 (EP) Second Communication pursuant to Article 94(3) EPC - App. 13765547.8	
	8	2018 Mar 21 (AU) First Examination Report - App. 2015382393 (007742.00096)	

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Examiner Signature	/ANH NGOC M NGUYEN/	Date Considered	09/24/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Examiner Name	K. B. Yao
Attorney Docket Number	007742.00091\US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2018-04-13
Name/Print	Joshua D. Schneider	Registration Number	67,194

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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First Named Inventor	Sean Moore
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	007742.00091\US

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6226372		2001-05-01	Beebe et al.	
	2	7721084		2010-05-18	Salminen et al.	
	3	7684400		2010-03-23	Govindarajan et al.	
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	7	6611875		2003-08-26	Chopra et al.	
	8	8806638		2014-08-12	Mani	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	Sean Moore
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	Attorney Docket Number	007742.00091\US

	9	8004994		2011-08-23	Darisi et al.	
	10	6098172		2000-08-01	Coss et al.	
	11	7331061	B1	2008-02-12	Ramsey et al.	
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	Attorney Docket Number	007742.00091\US

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	Filing Date	
	First Named Inventor	Sean Moore
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	007742.00091\US

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Bradley C. Wright/	Date (YYYY-MM-DD)	2017-06-06
Name/Print	Bradley C. Wright	Registration Number	38,061

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Application Number	15614956
Filing Date	2017-06-06
First Named Inventor	Sean Moore
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	007742.00091\US

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	41	International Search Report and Written Opinion for International App. No. PCT/US2015/024691, dated September 16, 2015.	
	42	International Preliminary Report on Patentability for International App. No. PCT/US2013/057502, dated April 28, 2015.	
	43	International Preliminary Report on Patentability for International App. No. PCT/US2014/023286, dated September 15, 2015.	
	44	International Preliminary Report on Patentability for International App. No. PCT/US2014/027723, dated September 15, 2015.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	007742.00091\US

	45	Statement RE: Related Application, dated July 24, 2015	
	46	2015 Dec 22 - (US) Final Office Action - App 14/714,207	
	47	2016 Feb 26 - (US) Non Final Office Action - App 14/253,992	
	48	2016 Apr 15 - (US) Notice of Allowance - App 14/855,374	
	49	2015 Nov 02 - (AU) Office Action - App 2013372879	
	50	2016 Apr 26 - (US) Office Action - App 14/745,207	

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Examiner Signature	/ANH NGOC M NGUYEN/	Date Considered	09/24/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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First Named Inventor	Sean Moore
Art Unit	N/A
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Attorney Docket Number	007742.00091\US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

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OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Bradley C. Wright/	Date (YYYY-MM-DD)	2017-06-06
Name/Print	Bradley C. Wright	Registration Number	38,061

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
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First Named Inventor	Sean Moore
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	007742.00091\US

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1	2016 May 06 - (US) Office Action - App 14/714,207	
	2	2016 May 13 - (US) Office Action - App 13/940,240	
	3	2016 Jun 14 - (US) Office Action - App 14/625,486	
	4	2016 Feb 25 - (AU) Office Action - App 2014249055	
	5	2016 Feb 24 - (AU) Office Action - App 2014228257	
	6	2016 Jun 09 - (WO) International Search Report - PCT/US2016/026339	
	7	2016 Jun 16 - (CA) Office Action - App 2,888,935	
	8	2016 Jul 11 - (EP) Office Action - App 14720824.3	
	9	2016 Jul 22 - (US) Office Action - App 14/921,718	
	10	2016 Jul 20 - (AU) Office Action - App 2013335255	
	11	2016 Oct 05 - (US) Notice of Allowance - App 14/698,560	

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	12	2016 Sept 13 - (CA) Office Action - App 2,902,206	
	13	2016 Sept 14 - (CA) Office Action - App 2,897,737	
	14	2016 Sept 26 - (CA) Office Action - App 2,902,158	
	15	2016 Oct 26 - (US) Office Action - App 13/940,240	
	16	2016 Nov 21 - (US) Office Action - App 14/745,207	
	17	2016 Dec 05 - (US) Notice of Allowance - App 14/714,207	
	18	Singh, Rajeev et al. "Detecting and Reducing the Denial of Service attacks in WLANs", December 2011, World Congress on Information and Communication TEchnologies, pp. 968-973	
	19	2017 Feb 10 - (US) Notice of Allowance - App 14/625,486	
	20	2017 Feb 15 - (US) Notice of Allowance - App 14/921,718	
	21	2017 Apr 12 - (US) Office Action - App 14/757,638	
	22	2017 Mar 06 - (WO) International Search Report and Written Opinion - App PCT/US2016/068008	

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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First Named Inventor	Sean Moore
Art Unit	
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Attorney Docket Number	007742.00091\US

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7913303	B1	2011-03-22	Rouland et al.	
	2	8832832	B1	2014-09-09	Visbal	
	3	6279113	B1	2001-08-21	Vaidya	
	4	8009566	B2	2011-08-30	Zuk et al.	
	5	6826694		2004-11-30	Dutta et al.	
	6	7143438	B1	2006-11-28	Coss et al.	
	7	7296288	B1	2007-11-13	Hill et al.	

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	1	20150372977	A1	2015-12-24	Yin	
	2	20160119365	A1	2016-04-28	Barel	
	3	20160294870	A1	2016-10-06	Banerjee et al.	
	4	20140150051	A1	2014-05-29	Bharali et al	
	5	20090028160	A1	2009-01-29	Eswaran et al	
	6	20160205069	A1	2016-07-14	Blocher et al.	
	7	20110277034	A1	2011-11-10	Hanson	
	8	20130104236	A1	2013-04-25	Ray et al.	
	9	20140259170	A1	2014-09-11	Amsler	
	10	20150033336	A1	2015-01-29	Wang	

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	11	20150106930	A1	2015-04-16	Honda et al.	
	12	20150244734	A1	2015-08-27	Olson et al	
	13	20150341389	A1	2015-11-26	Kurakami	
	14	20060133377	A1	2006-06-22	Jain	
	15	20140317397	A1	2014-10-23	Martini	
	16	20020112188	A1	2002-08-15	Syvanne	
	17	20030018591	A1	2003-01-23	Komisky	
	18	20030051026	A1	2003-03-13	Carter et al.	
	19	20030220940	A1	2003-11-27	Futoransky et al.	
	20	20040172529	A1	2004-09-02	Culbert	
	21	20040172557	A1	2004-09-02	Nakae et al.	

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	22	20050071650	A1	2005-03-31	Jo et al.	
	23	20060080733	A1	2006-04-13	Khosmood et al.	
	24	20060085849	A1	2006-04-20	Culbert	

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	2017 Jun 07 - (US) Office Action - App 14/745,207	
	2	2015 Sept 4 (US) Notice of Allowance - App. 14/702,755 (007742.00036)	
	3	2017 Jun 07 - (WO) International Search Report and Written Opinion - App PCT/US2016/067111	

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	4	2017 Aug 15 (WO) International Preliminary Report on Patentability - App. PCT/US2015/062691 (007742.00064)	
	5	2017 Aug 21 (AU) First Examination Report - App. 2015248067 (007742.00079)	
	6	2017 Sept 29 (CA) Examination Report - App. 2,772,630	
	7	2017 Oct 17 (WO) International Preliminary Report on Patentability - App. PCT/US2016/026339 (007742.00075)	
	8	2017 Nov 3 (US) Non-Final Office Action - App. 15/413,834 (007742.00085)	
	9	2017 Nov 21 (US) Notice of Allowance - App. 14/690,302 (007742.00042)	

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☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2018-01-15
Name/Print	Joshua D. Schneider	Registration Number	67,194

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15614956
Filing Date	2017-06-06
First Named Inventor	Sean Moore
Art Unit	2473
Examiner Name	Anh Ngoc M. Nguyen
Attorney Docket Number	007742.00091\US

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7792775	B2	2010-09-07	Matsuda	
	2	7814158	B2	2010-10-12	Malik	
	3	8307029	B2	2012-11-06	Davis et al.	
	4	9419942	B1	2016-08-16	Buruganahalli et al.	
	5	7095716		2006-08-22	Ke et al.	
	6	9172627		2015-10-27	Kjendal et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

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	1	20130291100	A1	2013-10-31	Ganapathy et al.	
	2	20050283823	A1	2005-12-22	Okajo et al.	
	3	20160366099	A1	2016-12-15	Jordan	
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	5	20160219065	A1	2016-07-28	Dasgupta et al.	
	6	20160285706	A1	2016-09-29	RAO	
	7	20160112443	A1	2016-04-21	GROSSMAN et al.	
	8	20160020968	A1	2016-01-21	Aumann et al.	
	9	20090262741	A1	2009-10-22	Jungck et al.	
	10	20070118894	A1	2007-05-24	Bhatia	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	2018 Apr 17 (US) Non-Final Office Action - App. 15/610,995 (007742.00090)	
	2	2018 May 25 (US) Notice of Allowance - App. 15/413,834	
	3	Chen, et al, "Research on the Anomaly Discovering Alogrithm of the Packet Filtering Rule Sets," September 2010, First Interntional Conferernce on Pervasive Computing, Signal Processing and Applications, pp. 362-366.	
	4	2018 Jul 5 (US) Non-Final Office Action - App. 15/413,750 (007742.00084)	
	5	2018 Jul 13 (US) Notice of Allowance - App. 15/414,117 (007742.00065)	
	6	2018 Jul 27 (US) Non-Final Office Action - App. 15/382,806 (007742.00082)	
	7	Sourcefire 3D System User Guide, Version 4.10, March 16, 2011, 2123 pages.	

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	8	2018 Jul 11 (US) Declaration of Kevin Jeffay, PhD in Support of Petition for Inter Partes Review of U.S. Patent No. 9,565,213 - IPR2018-01386	
	9	Ylonen, et al, "The Secure Shell (SSH) Transport Layer Protocol," SSH Communication Security Corp, Network Working Group RFC 4253, January 2006, 32 pages.	
	10	2018 Jul 20 (US) Declaration of Dr. Stuart Staniford in Support of Petition for Inter Partes Review of U.S. Patent No. 9,160,713 - IPR2018-01437	
	11	2018 Jul 20 (US) Declaration of Dr. Stuart Staniford in Support of Petition for Inter Partes Review of U.S. Patent No. 9,124,552 - IPR2018-01436	
	12	2018 Jul 26 (US) Declaration of Kevin Jeffay, PhD in Support of Second Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01444	
	13	Nichols, et al, "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers," Network Working Group RFC 2474, December 1998, 20 pages.	
	14	2018 Jul 26 (US) Declaration of Kevin Jeffay, PhD in Support of First Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01443	
	15	Perkins, "IP Encapsulation with IP," Network Working Group RFC 2003, October 1996, 14 pages.	
	16	2018 Jul 12 (US) Petition for Inter Partes Review of U.S. Patent No. 9,565,213 - IPR2018-01386	
	17	2018 Jul 20 (US) Petition for Inter Partes Review of U.S. Patent No. 9,160,713 - IPR2018-01437	
	18	2018 Jul 20 (US) Petition for Inter Partes Review of U.S. Patent No. 9,124,552 - IPR2018-01436	

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	Art Unit	2473
	Examiner Name	Anh Ngoc M. Nguyen
	Attorney Docket Number	007742.00091\US

	19	Blake, et al, "An Architechture for Differentiated Services," Network Working Group RFC 2475, December 1998, 36 pages.
	20	2018 Jul 27 (US) Second Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01444
	21	2018 Jul 27 (US) First Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01443

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EXAMINER SIGNATURE

Examiner Signature	/ANH NGOC M NGUYEN/	Date Considered	09/24/2018

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Examiner Name	Anh Ngoc M. Nguyen
Attorney Docket Number	007742.00091\US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

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☒ A certification statement is not submitted herewith.

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Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2018-08-08
Name/Print	Joshua D. Schneider	Registration Number	67,194

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	49	(("put" "post" "connect") near4 (denied deny$3 block$3)) same ("get" near4 (forward$3 allow$3 pass$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/24 08:22
L4	52	(("put" "post" "connect") near4 (denied deny$3 block$3) same filter$3) and ("get" near4 (forward$3 allow$3 pass$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/24 08:27
L6	12	(("put" "post" "connect") near4 (denied deny$3 block$3)) same ("get" near4 (forward$3 allow$3 pass$3) same http$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/24 08:41
L8	74	(("put" "post" "connect") near4 (denied deny$3 block$3)) same http$1 same (firewall$1 filter$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/24 08:43
L11	40	("get" near4 (forward$3 allow$3 pass$3) with http$1) same (filter$3 firewall$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/24 08:47
S1	1	"15614956"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/19 12:08
S2	14	((("Centripetal") near3 ("Networks") near3 ("Inc"))).AS,AANM.	USPAT	OR	ON	2018/09/19 12:08
S3	126	((("Moore") near3 ("Sean"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2018/09/19 12:08
S4	214	(filter$3 near4 (packet$1 pdu$1 cell$1 frame$1 datagram$1) and rule$1 and (drop$3 discard$3)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/19 12:11
S5	22	(application$1 near4 header$1) same (allow$3 pass$3 block$3 deny$3) with rule$1 same filter$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/19 12:58
S6	92	(application$1 near4 header$1) same (allow$3 pass$3 block$3 deny$3) with rule$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/19 12:58

S7	66	(application$1 near4 header$1) same rule$1 with filter$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/19 13:07
S8	9232	h04l45/74.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/19 13:07
S9	6	S6 and S8	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/19 13:07
S10	22	S6 and S7	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/19 13:07
S11	4	"20110055916"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/21 09:42
S12	5	"20100082811"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/21 10:26
S13	3	"20040039940".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/21 13:06
S14	13	(drop$4 discard$3) with (tls (transport near4 layer near4 security)) with version$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/21 14:26
S16	57	(drop$4 discard$3) same (tls (transport near4 layer near4 security)) with version$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/21 14:27
S18	39	(drop$4 discard$3) near4 (tls (transport near4 layer near4 security)) same rule$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/21 14:33
S20	27	(drop$4 discard$3) near4 (tls (transport near4 layer near4 security)) same (pdu$1 packet$1 cell$1 frame$1 datagram$1) same filter$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/21 14:34
S22	208	(drop$4 discard$3) near4 ("tls" (transport near4 layer near4 security)) same filter$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/21 14:36

S24	36	(denied deny$3 block$3 prevent$3) with ("tls" (transport near4 layer near4 security)) near4 version$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/21 14:37
S28	23	firewall$1 same ("tls" (transport near4 layer near4 security)) near4 version$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/21 14:45

EAST Search History (Interference)

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PTO/SB/08a (02-18)
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	5	7095716		2006-08-22	Ke et al.	
	6	9172627		2015-10-27	Kjendal et al.	

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	8	20160020968	A1	2016-01-21	Aumann et al.	
	9	20090262741	A1	2009-10-22	Jungck et al.	
	10	20070118894	A1	2007-05-24	Bhatia	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15614956
	Filing Date	2017-06-06
	First Named Inventor	Sean Moore
	Art Unit	2473
	Examiner Name	Anh Ngoc M. Nguyen
	Attorney Docket Number	007742.00091\US

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	2018 Apr 17 (US) Non-Final Office Action - App. 15/610,995 (007742.00090)	
	2	2018 May 25 (US) Notice of Allowance - App. 15/413,834	
	3	Chen, et al, "Research on the Anomaly Discovering Alogrithm of the Packet Filtering Rule Sets," September 2010, First Interntional Conferernce on Pervasive Computing, Signal Processing and Applications, pp. 362-366.	
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	5	2018 Jul 13 (US) Notice of Allowance - App. 15/414,117 (007742.00065)	
	6	2018 Jul 27 (US) Non-Final Office Action - App. 15/382,806 (007742.00082)	
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	Art Unit	2473
	Examiner Name	Anh Ngoc M. Nguyen
	Attorney Docket Number	007742.00091\US

	8	2018 Jul 11 (US) Declaration of Kevin Jeffay, PhD in Support of Petition for Inter Partes Review of U.S. Patent No. 9,565,213 - IPR2018-01386	
	9	Ylonen, et al, "The Secure Shell (SSH) Transport Layer Protocol," SSH Communication Security Corp, Network Working Group RFC 4253, January 2006, 32 pages.	
	10	2018 Jul 20 (US) Declaration of Dr. Stuart Staniford in Support of Petition for Inter Partes Review of U.S. Patent No. 9,160,713 - IPR2018-01437	
	11	2018 Jul 20 (US) Declaration of Dr. Stuart Staniford in Support of Petition for Inter Partes Review of U.S. Patent No. 9,124,552 - IPR2018-01436	
	12	2018 Jul 26 (US) Declaration of Kevin Jeffay, PhD in Support of Second Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01444	
	13	Nichols, et al, "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers," Network Working Group RFC 2474, December 1998, 20 pages.	
	14	2018 Jul 26 (US) Declaration of Kevin Jeffay, PhD in Support of First Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01443	
	15	Perkins, "IP Encapsulation with IP," Network Working Group RFC 2003, October 1996, 14 pages.	
	16	2018 Jul 12 (US) Petition for Inter Partes Review of U.S. Patent No. 9,565,213 - IPR2018-01386	
	17	2018 Jul 20 (US) Petition for Inter Partes Review of U.S. Patent No. 9,160,713 - IPR2018-01437	
	18	2018 Jul 20 (US) Petition for Inter Partes Review of U.S. Patent No. 9,124,552 - IPR2018-01436	

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	Art Unit	2473
	Examiner Name	Anh Ngoc M. Nguyen
	Attorney Docket Number	007742.00091\US

	19	Blake, et al, "An Architechture for Differentiated Services," Network Working Group RFC 2475, December 1998, 36 pages.
	20	2018 Jul 27 (US) Second Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01444
	21	2018 Jul 27 (US) First Petition for Inter Partes Review of U.S. Patent No. 9,137,205 - IPR2018-01443

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2018-08-08
Name/Print	Joshua D. Schneider	Registration Number	67,194

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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EFS ID:	33406021
Application Number:	15614956
International Application Number:	
Confirmation Number:	9334
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Customer Number:	22907
Filer:	Joshua Daniel Schneider/Jennifer Brady
Filer Authorized By:	Joshua Daniel Schneider
Attorney Docket Number:	007742.00091\US
Receipt Date:	08-AUG-2018
Filing Date:	06-JUN-2017
Time Stamp:	10:44:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	Information_Disclosure_Statement_Fillable_PDF_19276551.pdf	1035809 a419980f1dbf688f641ef663f1b3d9f138576553	no	7

Warnings:

Information:					
2	Non Patent Literature	Non-Final_Rejection__892__1449_19085024.pdf	1396691 9c52a21832ee261560afbf5f5f03715c1e6e25b6	no	44
Warnings:					
Information:					
3	Non Patent Literature	Notice_of_Allowance_and_Fees_Due_PTOL-85__892__1449_19159973.pdf	993642 13acd247185836dccad56ca991340d2c07fe16f5	no	22
Warnings:					
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4	Non Patent Literature	Zen_et_al_Research_on_the_Anomaly_Discovering_Algorithm_of_the_Packet_Filtering_Ru_19165378.pdf	321630 644fd90f2591162e17ccbbabf69a09eca68e0b8c	no	5
Warnings:					
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5	Other Reference-Patent/App/Search documents	Non-Final_Rejection__892__1449_19225307.pdf	2293959 4f5db9f763a28837ce8bad1307644850da9f7a9c	no	67
Warnings:					
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6	Other Reference-Patent/App/Search documents	Notice_of_Allowance_and_Fees_Due_PTOL-85__EXIN__OAAPPENDIX__892__1449_19240939.pdf	2734456 f98738f8b194e51cc5f6fa31d6db4c7755ae2968	no	79
Warnings:					
Information:					
7	Other Reference-Patent/App/Search documents	Non-Final_Rejection__892__1449_19265697.pdf	2840908 99555f5f9d1833ce552974d21ae03a5aed96fe9b	no	74
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8	Non Patent Literature	Sourcefire_3D_System_User_Guide_v4_19276377pt1.pdf	21834043 15d025838ed0c2ed9b20822b691f20ae9e4489bf	no	530
Warnings:					
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9	Non Patent Literature	Sourcefire_3D_System_User_Guide_v4_19276377pt2.pdf	17491516 f70e306c09b9ad1d5077b2724876a0606734c8d1	no	530
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10	Non Patent Literature	Sourcefire_3D_System_User_Guide_v4_19276377pt3.pdf	22009154 f6ff663e4dce35cd858bd47d36d305e1b458ff16	no	530
Warnings:					
Information:					
11	Non Patent Literature	Sourcefire_3D_System_User_Guide_v4_19276377pt4.pdf	19000688 76616c89950c273d60d2ab4aae6c9c058f83b659	no	533
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Information:					
12	Non Patent Literature	IPR2018-01386_Declaration_of_Kevin_Jeffay_in_Support_of_Petition_19276389.pdf	2271094 40ef678bdae19f125107119344688ada23eebc9b	no	176
Warnings:					
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13	Non Patent Literature	Ylonen_The_Secure_Shel_SSH_Transport_Layer_Protocol_19276392.pdf	131760 fb4d0cd54dd66d7e7c5da71d0234d60d653f049e	no	32
Warnings:					
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14	Non Patent Literature	IPR2018-01437_Declaration_of_Dr_Stuart_Saniford_in_Support_of_Petition_19276398.pdf	1692667 4c7469e136e55d2930f2ac6559c9f9b885fd7d59	no	102
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15	Non Patent Literature	IPR2018-01436_Declaration_of_Saniford_in_Support_of_Petition_19276401.pdf	1944315 495739724b7f8805cc9c6c2ef671ed44cbc06499	no	113
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16	Non Patent Literature	IPR2018-01444_Delcaration_of_Kevin_Jeffay_in_Suport_of_Petition_19276405.pdf	11025003 815fa9170848b3c639f841fbb24089e05127443c	no	248
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17	Non Patent Literature	Nichols_et_al_Definition_of_the_Differentiated_Services_Field_in_the_IPv4_and_IPv6_19276407.pdf	90517 e0cccda6d5c070637ba1f31878d0ad8ba6f34d5d1	no	20
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18	Non Patent Literature	IPR2018-01443_Decalration_of_Kevin_Jeffay_in_Support_of_First_Petition_19276410.pdf	5547515 8cccdf8590847d9727bf65874f8066f4d5520ca3	no	252
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Warnings:					
Information:					
20	Non Patent Literature	2018_Jul_12_US_Petition_IPR_9565213_IPR2018-01386_19276421.pdf	818480 1e02a202671edef3d73f55ec95db67773124a51d	no	87
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Information:					
21	Non Patent Literature	2018_Jul_20_US_Petition_IPR_9160713_IPR2018-01437_19276424.pdf	1498827 fedd2db94e024c39881f79d7027568f6b4f5627b	no	79
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22	Non Patent Literature	2018_July_20_US_Petition_IPR_9124552_IPR2018-01436_19276426.pdf	1491679 3758a4d7ad63aefe245f73e6ea26f4fe64d44858	no	81
Warnings:					
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23	Non Patent Literature	Blake_et_al_An_Architecture_of_Differentiated_Services_19276427.pdf	88674 77dc7fcfaaa7cba6bb52e45070569fee61800125	no	36
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24	Non Patent Literature	2018_Jul_27_US_Second_Petition_IPR_9137205_IPR2018-01444_19276430.pdf	1761077 8bf4972d13143286e4bbb90b1fc491b860cdf0dc	no	108
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/614,956	06/06/2017	Sean Moore	007742.00091\US

CONFIRMATION NO. 9334

22907
BANNER & WITCOFF, LTD.
1100 13th STREET, N.W.
SUITE 1200
WASHINGTON, DC 20005-4051

PUBLICATION NOTICE



Title:FILTERING NETWORK DATA TRANSFERS

Publication No.US-2018-0123955-A1
Publication Date:05/03/2018

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Filing Date	2017-06-06
First Named Inventor	Sean Moore
Art Unit	2473
Examiner Name	K. B. Yao
Attorney Docket Number	007742.00091\US

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7814546	B1	2010-10-12	Strayer et al.	

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	1	20040123220	A1	2004-06-24	Johnson et al.	

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	Examiner Name	K. B. Yao
	Attorney Docket Number	007742.00091\US

	1	2017 Sep 5 (US) Memorandum in Support of Defendant's Ixia and Keysight Techonologies, Inc's Motion to Dismiss for Unpatentability Under 35 U.S.C. § 101 - Case No. 2:17-cv-00383-HCM-LRL, Document 21, 29 pages.
	2	2017 Sep 5 (US) Request for Judicial Notice in Support of Defendants Ixia and Keysight Technologies, Inc's Motion to Dismiss for Unpatentability under 35 U.S.C. § 101 - Case No. 2:17-cv-00383-HCN-LRL, Document 22, 3 pages.
	3	2017 Jul 20 (US) Complaint for Patent Infringement - Case No. 2:17-cv-00383-HCN-LRL, Document 1, 38 pages.
	4	2017 Sep 5 (US) Defendant Ixia's Partial Answer to Complaint for Patent Infringement - Case No. 2:17-cv-00383-HCN-LRL, Document 29, 14 pages.
	5	2018 Mar 8 (US) Non-Final Office Action - App. 14/745,207
	6	2018 Mar 16 (EP) Communication Pursuant to Rule 164(2)(b) and Aritcle 94(3) EPC - App. 15722292.8
	7	2018 Mar 15 (EP) Second Communication pursuant to Article 94(3) EPC - App. 13765547.8
	8	2018 Mar 21 (AU) First Examination Report - App. 2015382393 (007742.00096)

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	Examiner Name	K. B. Yao
	Attorney Docket Number	007742.00091\US

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See attached certification statement.

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☒ A certification statement is not submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Joshua D. Schneider/	Date (YYYY-MM-DD)	2018-04-13
Name/Print	Joshua D. Schneider	Registration Number	67,194

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EXHIBIT 1

US006826694B1

(12) **United States Patent**
Dutta et al.

(10) **Patent No.: US 6,826,694 B1**
(45) **Date of Patent: Nov. 30, 2004**

(54) **HIGH RESOLUTION ACCESS CONTROL**

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(73) Assignee: **AT&T Corp.**, New York, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/422,952**

(22) Filed: **Oct. 22, 1999**

Related U.S. Application Data

(60) Provisional application No. 60/105,188, filed on Oct. 22, 1998.

(51) **Int. Cl.**[7] **G06F 11/30**; G06F 15/173

(52) **U.S. Cl.** **713/201**; 709/224

(58) **Field of Search** 713/201, 200, 713/151, 152, 154; 709/224, 225, 229

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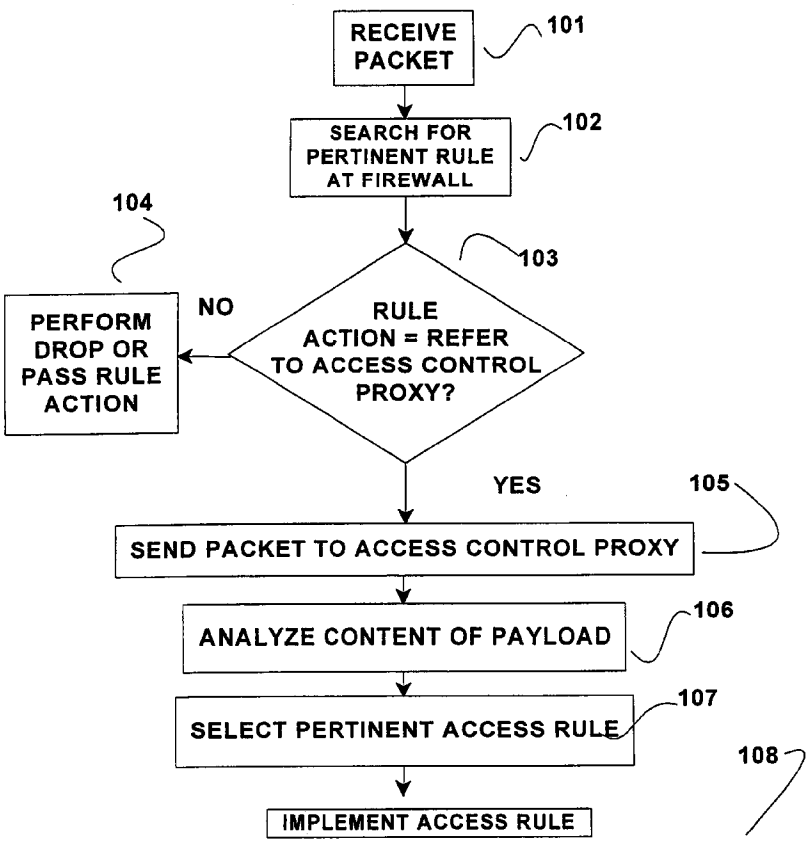
* cited by examiner

Primary Examiner—Matthew Smithers

(57) **ABSTRACT**

A system and method for high resolution access control for packetized information. A packet is received at a firewall. A rule corresponding to header information in the packet prescribes referring the packet to an access control proxy. The access control proxy analyzes the contents of the packet, and identifies a rule based upon the contents. The rule is implemented at the firewall.

1 Claim, 3 Drawing Sheets



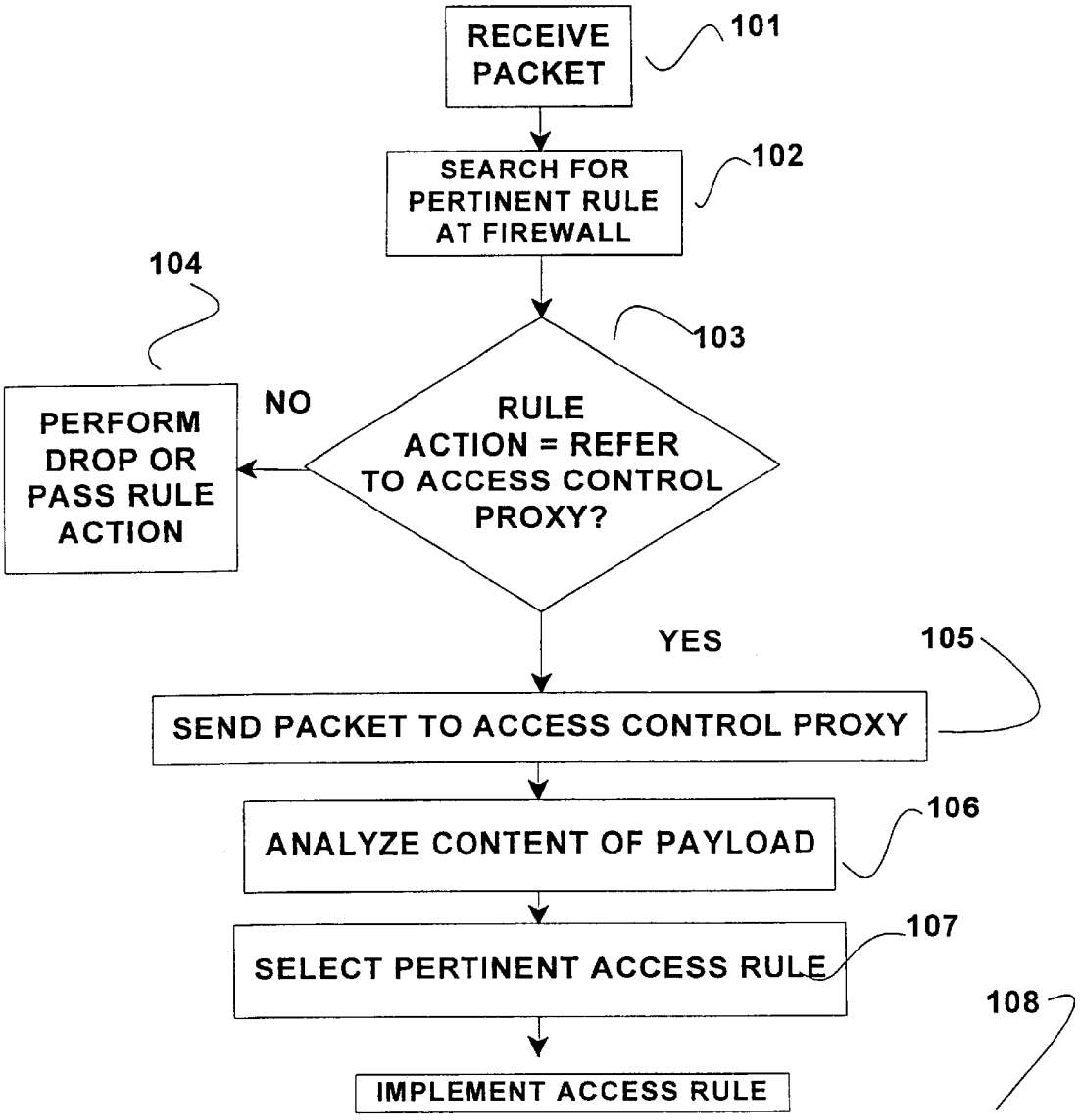

RECEIVE PACKET
101
SEARCH FOR PERTINENT RULE AT FIREWALL
102
104
103
PERFORM DROP OR PASS RULE ACTION
NO
RULE ACTION = REFER TO ACCESS CONTROL PROXY?
YES
105
SEND PACKET TO ACCESS CONTROL PROXY
ANALYZE CONTENT OF PAYLOAD
106
SELECT PERTINENT ACCESS RULE
107
108
IMPLEMENT ACCESS RULE

FIG 1

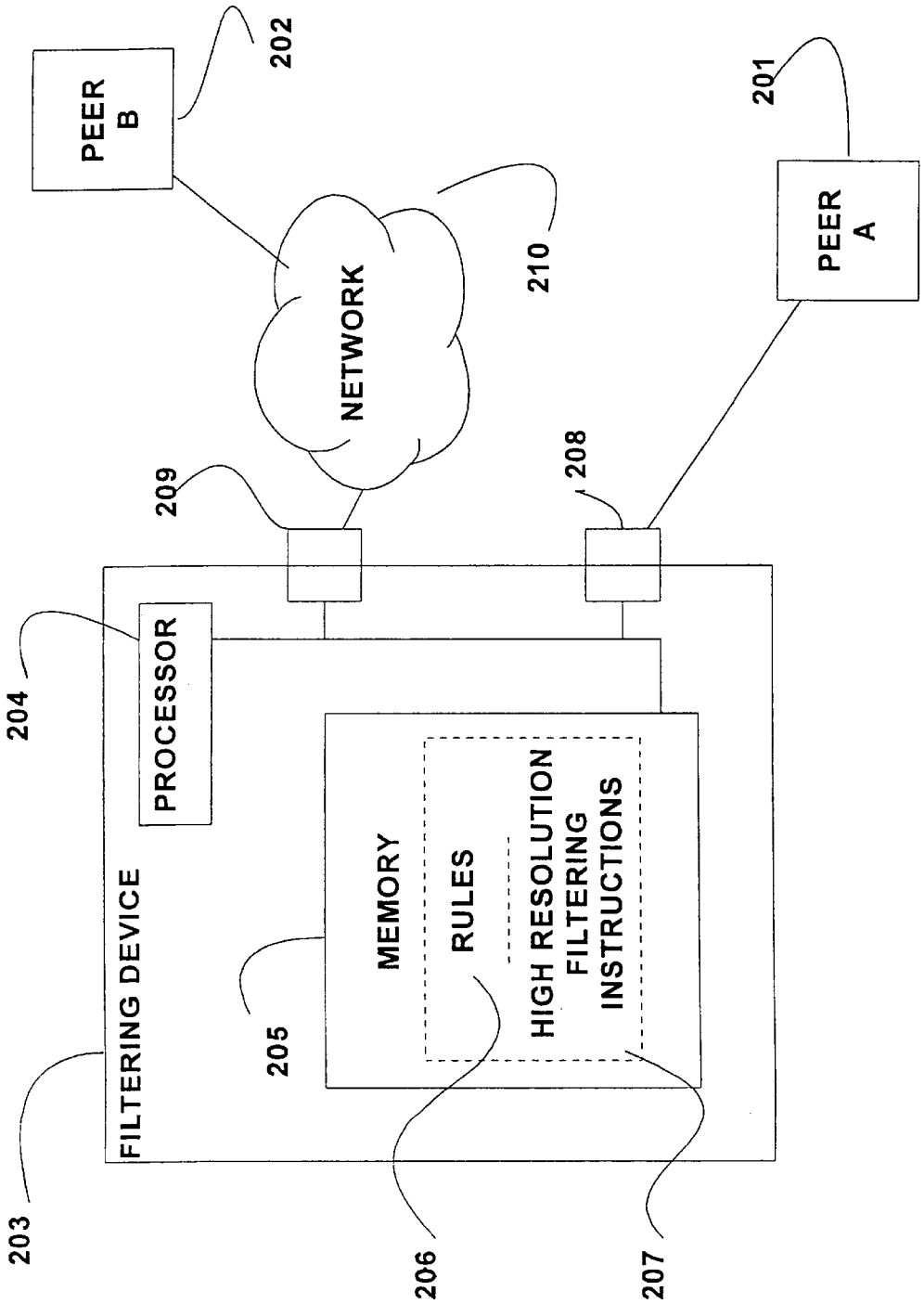

PEER B
202
201
PEER A
NETWORK
210
209
208
204
PROCESSOR
FILTERING DEVICE
MEMORY
RULES
HIGH RESOLUTION FILTERING INSTRUCTIONS
205
203
206
207

FIG 2

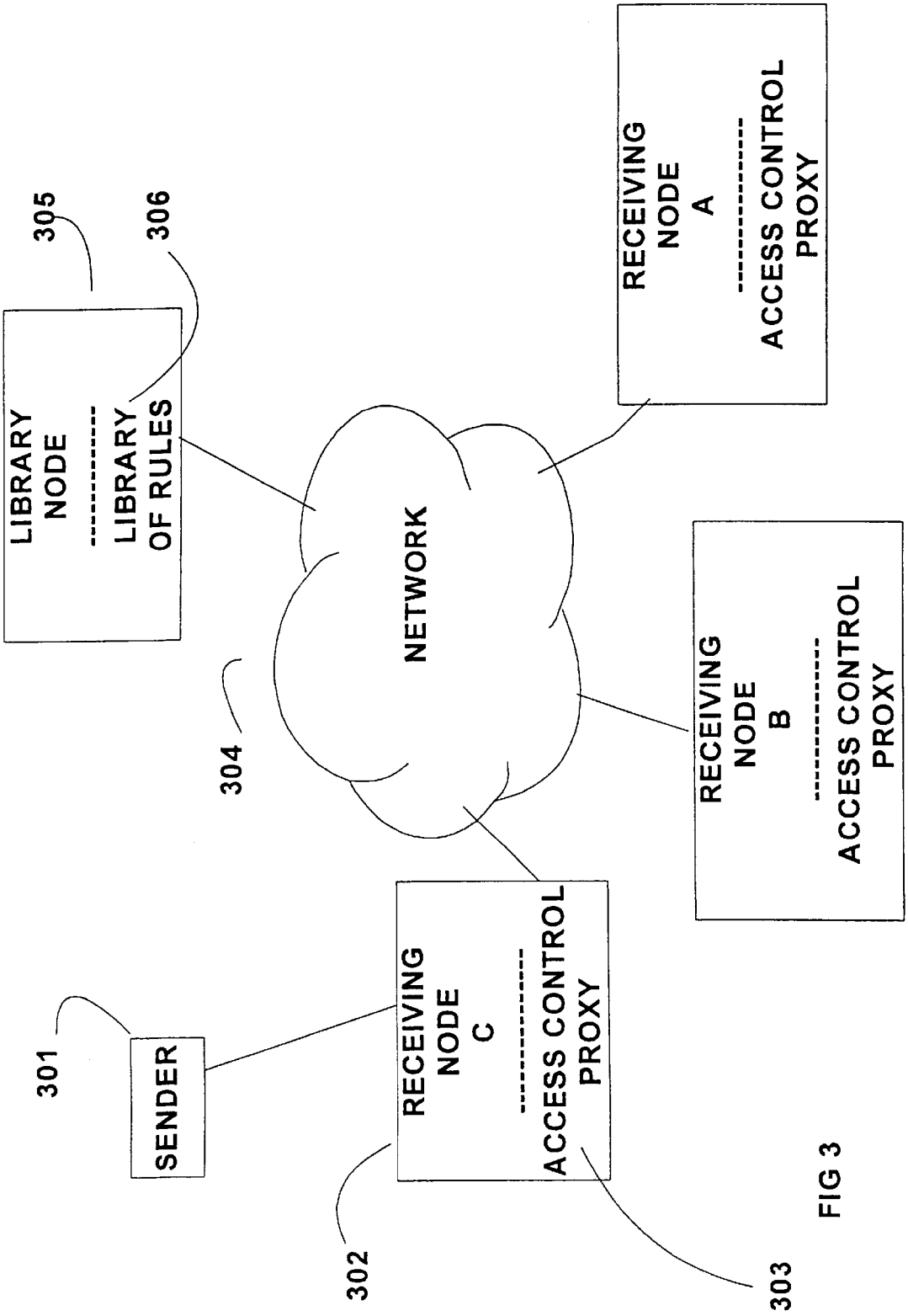

LIBRARY NODE
LIBRARY OF RULES
305
306
NETWORK
304
RECEIVING NODE A
ACCESS CONTROL PROXY
RECEIVING NODE B
ACCESS CONTROL PROXY
RECEIVING NODE C
ACCESS CONTROL PROXY
SENDER
301
302
303

FIG 3

HIGH RESOLUTION ACCESS CONTROL

CROSS REFERENCE TO RELATED APPLICATION

This application claims priority to provisional application 60/105,188 entitled "HIGH RESOLUTION ACCESS CONTROL," filed Oct. 22, 1998, the contents of which are incorporated herein by reference.

FIELD OF THE INVENTION

The field of the invention is information systems access control, and in particular high resolution filtering of packetized information.

BACKGROUND OF THE INVENTION

A firewall regulates the flow of packetized information. A packet includes a header and a payload. The header includes header parameters, including a source and destination address for the packet, as well as source and destination port numbers and a protocol number. Other examples of header parameters include various flags (e.g., security features implemented with respect to the packet (AUTHENTICATED, ENCRYPTED), quality of service requirements (e.g., HIGH, MEDIUM, LOW) for handling the packet, a priority parameter for handling the packet (e.g., ROUTINE, URGENT, FLASH), etc.) The payload includes the data meant to be conveyed by the packet from its source to its intended destination.

A known firewall is placed between the packet's source and intended destination, where it intercepts the packet. The known firewall filters a packet based upon the packet's header parameters and a rule loaded into the firewall. The rule correlates a pattern in the header of a packet with a prescribed action, either PASS or DROP. The filter identifies the rule that applies to the packet based upon the packet's header, and then implements the rule's prescribed action. When a DROP action is performed, the packet is blocked (deleted), and does not reach its intended destination. When a PASS action is performed, the packet is passed on toward its intended destination. The set of rules loaded into a firewall reflect a security policy, which prescribes what type of information is permissible to pass through the firewall, e.g., from which source, to which destination, for which applications, etc.

The set of rules loaded into a known firewall operate at a low level of resolution. As described above, a firewall rule prescribes a PASS or DROP action based only upon the header parameters of the packet. Packet header parameters alone do not reveal the ultimate target of, for example, a connection request from a sender to a destination host. For example, a HyperText Transfer Protocol (HTTP) connection request to send the file located at http://www.att.com/secret.html is not entirely disclosed in the header of the packet initiating the request. The header reveals the Internet Protocol (IP) address of the proxy corresponding to the domain name att.com. However, information regarding the particular file that is being requested, secret.html, is embedded in the payload of the packet. Since known firewalls only filter packets based upon their header parameters, known filters cannot PASS or DROP a packet on the basis of a particular file at a given destination. The same shortfall in known filters exists for filtering a packet destined for a particular newsgroup, chat session, e-mail address, etc.

SUMMARY OF THE INVENTION

The present invention provides high resolution access control for packetized information. In accordance with one

embodiment of the present invention, a packet is received at a firewall and referred to an access control proxy. The access control proxy analyzes the contents of the packet, and identifies an access rule based upon the contents. The action prescribed by the access rule is performed with respect to the packet and any related packets. This advantageously provides for filtering a packet based not only upon its header information, as in known firewalls, but upon the information contained in the packet payload.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a flow chart showing the method in accordance with an embodiment of the present invention.

FIG. **2** shows an apparatus in accordance with an embodiment of the present invention.

FIG. **3** shows a system in accordance with the present invention.

DETAILED DESCRIPTION

A flow chart showing the method in accordance with an embodiment of the present invention is shown in FIG. **1**. A packet is received at a firewall, step **101**. The packet has at least one header parameter and a payload. As discussed above, a packet is a discrete unit of information. In one embodiment of the present invention, a packet includes a header and a payload. The header includes header parameters, such as source address, source port, destination address, destination port and protocol number. The payload of the packet includes data being conveyed by the packet, e.g., a connection request, document data, etc. An example of a packet is an Internet Protocol (IP) packet, described in RFC 791, <http://www.library.ucg.ie/CIE/RFC/791/index.htm, visited Sep. 23, 1998>.

After the packet is received, an access rule is identified that corresponds to at least one header parameter of the packet. In one embodiment, this access rule is stored locally at the firewall. In another embodiment, this access rule is obtained from a node external to the firewall.

In accordance with an embodiment of the present invention, the action prescribed by the rule that corresponds to the received packet's header information indicates that the packet is to be referred to an access control proxy. In one embodiment, the access control proxy is specific to a single protocol, e.g., the file transfer protocol (FTP), the hypertext transfer protocol (HTTP), newsgroup protocol, etc.

The access control proxy selects an access rule based upon the contents of the packet. In one embodiment, the access rule is stored locally at the firewall. In another embodiment, the access rule is retrieved from a node external to the firewall. In one embodiment, the access rule is selected based upon the name of the requested file. In another embodiment, it is selected on the basis of the URL of the requested information. For example, an access rule can be selected based upon the domain name of the requested information, or the nth degree domain name of a URL in a packet payload. The "nth degree domain name" is defined as follows: a domain name is comprised of text strings separated by periods, e.g., a.b.c.d.e. The rightmost string (e.g., "e" in the example) is the first degree domain name, the string immediately to the left on the other side of the period is the second degree domain name (e.g., "d" in the example), and each string further to the left is incremented by one degree. Thus, "c" is the third degree domain name, "b" is the fourth degree, etc.

After selecting the access rule based upon the contents of the packet, the access rule is implemented for that packet

and any related packets. A related packet, for example, is another packet in the same session request as the first packet. For example, a session is likely to include many packets. The packet or packets that contain sufficient payload information for the access proxy to select a corresponding access rule will be PASSED or DROPPED in accordance with the selected access rule, as will any other packets that comprise the connection request.

This process is shown in more detail in FIG. **1**. A packet is received, step **101**. The set of rules stored at the firewall is searched for a rule that pertains to the header parameters of the packet, step **102**. When such a rule is identified, it is determined if the prescribed action of the rule is to refer the packet to an access control proxy, step **103**. If the prescribed action is not to refer the packet, the action is to PASS or DROP the packet, which is performed for the packet, step **104**. If the prescribed action is to refer the packet, the packet is then sent to the access control proxy, step **105**. In one embodiment, the access control proxy analyzes the content of the packet payload to determine details not available from the header parameters as to the information which the payload requests, step **106**. In another embodiment, the access control proxy analyzes the contents of a plurality of received packets to determine details pertaining to a request for information that is constituted by the plurality of payloads. The number of packet analyzed is sufficient to select an access rule pertaining to the detailed information request, i.e., to decide whether to PASS or DROP the packets pertinent to the request.

The access control proxy then selects an access rule pertaining to the detailed information request contained in the packet payload, step **107**. For example, an access rule prescribes a DROP action for any packet that requests the file located at http://www.att.com/secret.html. On the other hand, an access rule prescribes a PASS action for any packet that requests the file located at http://www.att.com/public.html.

In one embodiment of the present invention, the access control proxy selects an access rule that pertains to the packet based both on an analysis of the payload and the header parameters of the packet. For example, the source address of the packet is included in the header as a header parameter. In one embodiment, the access control proxy selects an access rule that prescribes a DROP action for any packet that requests the file http://www.att.com/secret.html and whose header indicates the packet is from SOURCE A, whereas another selected access rule prescribes a PASS action for any packet that requests the same file, but whose header indicates the packet is from SOURCE B.

In one embodiment of the present invention, the access control proxy then implements the selected access rule for the packet, performing either a PASS or a DROP action with respect to the packet, in accordance with the access rule, step **108**.

An apparatus in accordance with an embodiment of the present invention is shown in FIG. **2**. Peer A **201** (the sender) sends a packet of information addressed to destination Peer B **202** (the destination) through filtering device **203**. The packet payload includes an identifier of a file (e.g., a filename and directory information) requested by peer A **201** and stored at peer B **202**. Filtering device **203** comprises a processor **204**, a memory **205** that stores rules **206** (e.g., both rules that refer a packet to the access control proxy and access rules that are selected by the access control proxy) and high resolution filtering instructions **207** adapted to be executed by processor **204** to perform steps of the method in accordance with an embodiment of the present invention. The filtering device **203** also includes a first port **208** through which the packet is received from Peer A **201**, and a second port **209** through which the packet will pass to Peer B **202** through network **210** if the pertinent rule prescribes a PASS action with respect to the packet.

Peers **201** and **202** are each a computer with a permanent or temporary network address. Network **210** is any information systems network across which the information in the packet can be sent. Examples of network **210** include the Internet, an intranet, a virtual private network, etc.

In one embodiment, processor **204** is a general purpose microprocessor, such as the Pentium II microprocessor manufactured-by the Intel Corporation of Santa Clara, Calif. In another embodiment, processor **204** is an Application Specific Integrated Circuit (ASIC), which has been specifically designed to perform at least some of the steps of the method in accordance with an embodiment of the present invention. ASICs are well-known in the art for application such as digital signal processing. In an embodiment of the present invention that includes an ASIC, at least part of the high resolution filtering instructions **207** can be implemented in the design of the ASIC.

Memory **205** can be Random Access Memory (RAM), a hard disk, a floppy disk, an optical digital storage medium, or any combination thereof. Memory **205** is meant to encompass any means for storing digital information.

High resolution filtering instructions **207** are adapted to be executed by processor **204** to receive a packet, refer the packet to an access control proxy, select an access rule base upon the contents of the payload of the received packet, and then implement the access rule by performing the action (typically PASS or DROP) prescribed by the selected rule with respect to a packet. The term "high resolution filtering instructions" is meant to include access control proxy instructions. In one embodiment, the access rule is retrieved based upon a combination of the contents and header parameters of the packet. In another embodiment, the access rule is selected based upon the contents of one or several packet payloads.

In one embodiment of the present invention, high resolution filtering instructions **207** include firewall instructions and access control proxy instructions. In one embodiment, the firewall instructions are executed on processor **204** as a firewall process, and the access control proxy instructions are executed on processor **204** as an access control proxy process. When filtering device **203** receives a packet, the firewall process searches for and identifies a rule pertinent to the packet. The rule prescribes an action, either PASS, DROP or to REFER the packet to an access control proxy. In one embodiment of the present invention, there is a distinct access control proxy for each different protocol to which a packet can conform, e.g., HTTP, FTP, e-mail, newsgroup, telnet, etc. The protocol of a packet in one embodiment is indicated as a protocol number in the packet header. An embodiment of the present invention advantageously uses the protocol number in the header to refer a packet to the correct access control proxy process.

When a packet is referred to an access control proxy process, the proxy process analyzes the contents of the packet and selects an access rule based upon the results the content analysis. In one embodiment, the selected access rule is stored locally. In another embodiment, the selected access rule is retrieved from an external database. In yet another embodiment, the access rule is dynamically formulated by the proxy. The access rule is implemented at the firewall.

In one embodiment of the present invention, several (more than one) packets are referred to the access control proxy process. The access control proxy process analyzes the contents of the several packets, and selects an access rule based upon the results of this analysis. In one embodiment, the information needed to select an access rule is spread across the contents of the several packets, and may not be contained in any one of the several packets alone. Thus, in one embodiment, the contents of a packet may be represented as:

Packet: SELECT_RULE_**1432**

This shows that there is sufficient information in the single packet to identify the rule that should be selected. On the other hand, consider four packets that contain the following information:

Packet 1: SELECT_RULE_FIRST_DIGIT_**1**
Packet 2: SELECT_RULE_SECOND_DIGIT_**4**
Packet 3: SELECT_RULE_THIRD_DIGIT_**3**
Packet 4: SELECT_RULE_FOURTH_DIGIT_**2**

The above example is primarily heuristic. Another example arises when several packets need to be analyzed to determine what type of message is being carried by the packets, and where traffic is regulated through the firewall based upon the type of message being carried.

In one embodiment, there are a plurality of ports to and from numerous destinations. The port or ports that communicate packets to and from filtering device **203** are meant to encompass any number or configuration of ports. The port configuration is expected to vary to suit the particular connectivity required of a filtering device **203** in a given situation, i.e., in a given context or architecture in which parties communicate through filtering device **203**.

In various embodiments, the functions of the present invention are performed on separate nodes. In one embodiment shown in FIG. **3**, a packet is received from a sender **301** at one of a plurality of receiving nodes **302**, which node **302** then refers the packet to a locally executing access control proxy **303**. If the local access control proxy **303** does not store a rule corresponding to the contents of the packet, it sends a query through network **304** to another separate node **305** that can advantageously function as a central library that stores a large number of access rules **306**, only some of which may be needed at any one time by the plurality of receiving nodes **302**. The library node **305** identifies the pertinent access rule from its collection of access rules **306**, and then sends it to the access control proxy at the requesting receiving node **302**, which then implements it. This illustrates the advantageous scalability of the present invention. Only relatively few library sites (in relation to the number of receiving nodes) need store large numbers of access rules.

In another embodiment, the firewall is on a receiving node **302**, and performs firewall functions, including receiving a packet (using a rule), referring the packet to the access control proxy, and implementing an access rule. The access control proxy is on another node **305**, and there performs proxy functions including analyzing the packet and selecting an access rule, which it then sends to the receiving node **302** to implement. In other words, the firewall functions can be performed by a different processor than processor that performs the proxy functions.

A medium that stores instructions adapted to be executed on a processor, like memory **205**, is meant to encompass any medium capable of storing digital information. Examples of a medium that stores instructions include a hard disk, a floppy disk, a Compact Disk Read Only Memory (CD-ROM), magnetic tape, flash memory, etc.

The term "instructions adapted to be executed" is meant to encompass more than machine code. The term "instructions adapted to be executed" is meant to encompass source code, assembler, and any other expression of instructions that may require preprocessing in order to be executed by processor. For example, also included is code that has been compressed or encrypted, and must be uncompressed and/or unencrypted in order to be executed by a processor.

The present invention advantageously provides a more efficient, flexible and scalable system and method for implementing the rules of a security policy or policies at a filtering device, because a rule is only loaded at the filtering device when the rule is needed.

What is claimed is:

1. A method for filtering a packet, including the steps of:

a. receiving a packet having at least one header parameter and a payload;

b. selecting an access rule based upon the contents of the payload of the packet received in step a;

c. implementing the access rule for a packet, wherein the access rule is selected based upon a combination of the contents of the packet received in step a and the contents of at least one other packet.

* * * * *

EXHIBIT 2

US 20090028160A1

(19) **United States**

(12) **Patent Application Publication**

ESWARAN et al.

(10) **Pub. No.: US 2009/0028160 A1**

(43) **Pub. Date: Jan. 29, 2009**

(54) **METHOD AND APPARATUS FOR DETECTING MALICIOUS ROUTERS FROM PACKET PAYLOAD**

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FORT COLLINS, CO 80527-2400 (US)

(21) Appl. No.: **12/141,927**

(22) Filed: **Jun. 19, 2008**

(30) **Foreign Application Priority Data**

Jul. 26, 2007 (IN) 1614/CHE/2007

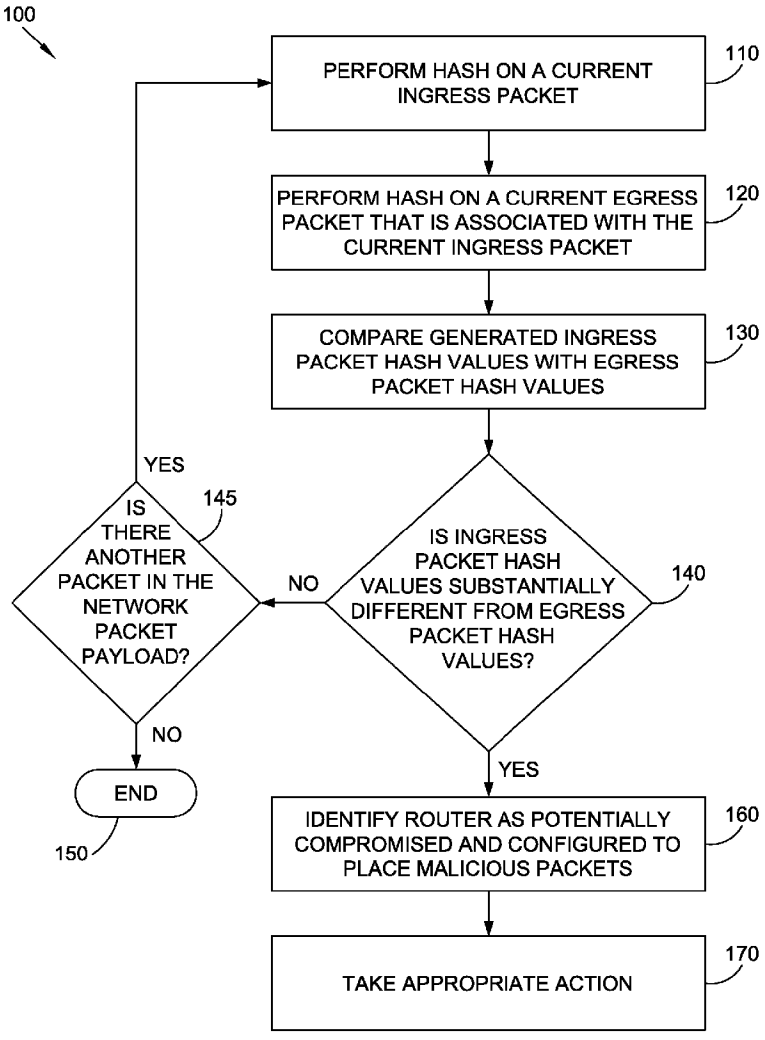
Publication Classification

(51) **Int. Cl.**
H04L 12/56 (2006.01)

(52) **U.S. Cl.** **370/395.32**

(57) **ABSTRACT**

The method, apparatus and system of detecting whether a router is compromised and configured to place malicious packets onto the network are disclosed. In one embodiment, a method for detecting a malicious router includes performing hash on a current ingress packet received via the network packet payload to generate ingress packet hash values. Further, includes performing hash on current egress packet that is associated with the current ingress packet to generate egress packet hash values. The generated ingress packet hash values and the egress packet hash values are then compared. Then the router is checked to determine whether it is potentially compromised and configured to place the malicious packets based on the outcome of the comparison.



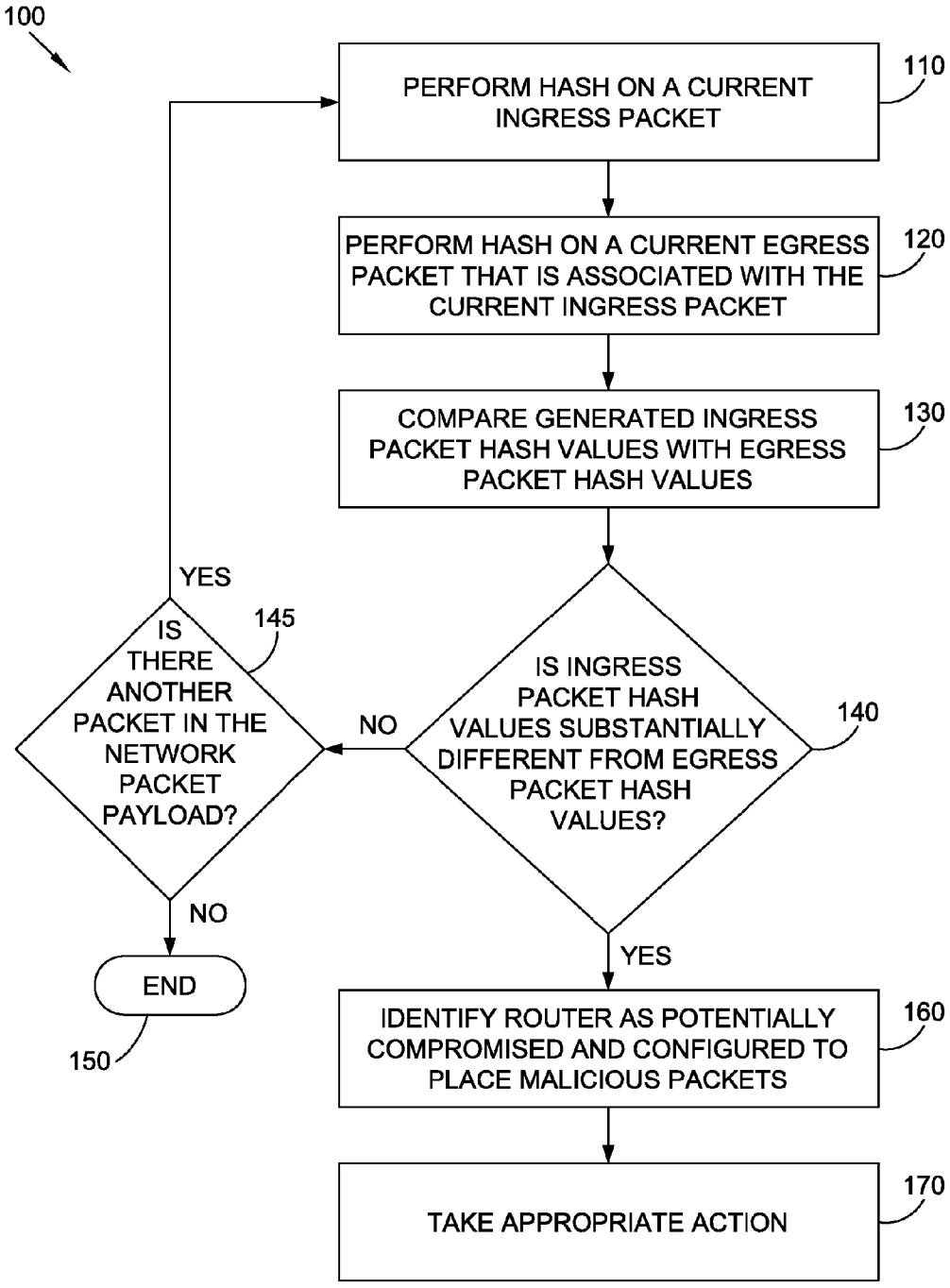

100
PERFORM HASH ON A CURRENT INGRESS PACKET
110
PERFORM HASH ON A CURRENT EGRESS PACKET THAT IS ASSOCIATED WITH THE CURRENT INGRESS PACKET
120
COMPARE GENERATED INGRESS PACKET HASH VALUES WITH EGRESS PACKET HASH VALUES
130
IS INGRESS PACKET HASH VALUES SUBSTANTIALLY DIFFERENT FROM EGRESS PACKET HASH VALUES?
140
NO
YES
IS THERE ANOTHER PACKET IN THE NETWORK PACKET PAYLOAD?
145
YES
NO
END
150
IDENTIFY ROUTER AS POTENTIALLY COMPROMISED AND CONFIGURED TO PLACE MALICIOUS PACKETS
160
TAKE APPROPRIATE ACTION
170

FIG. 1

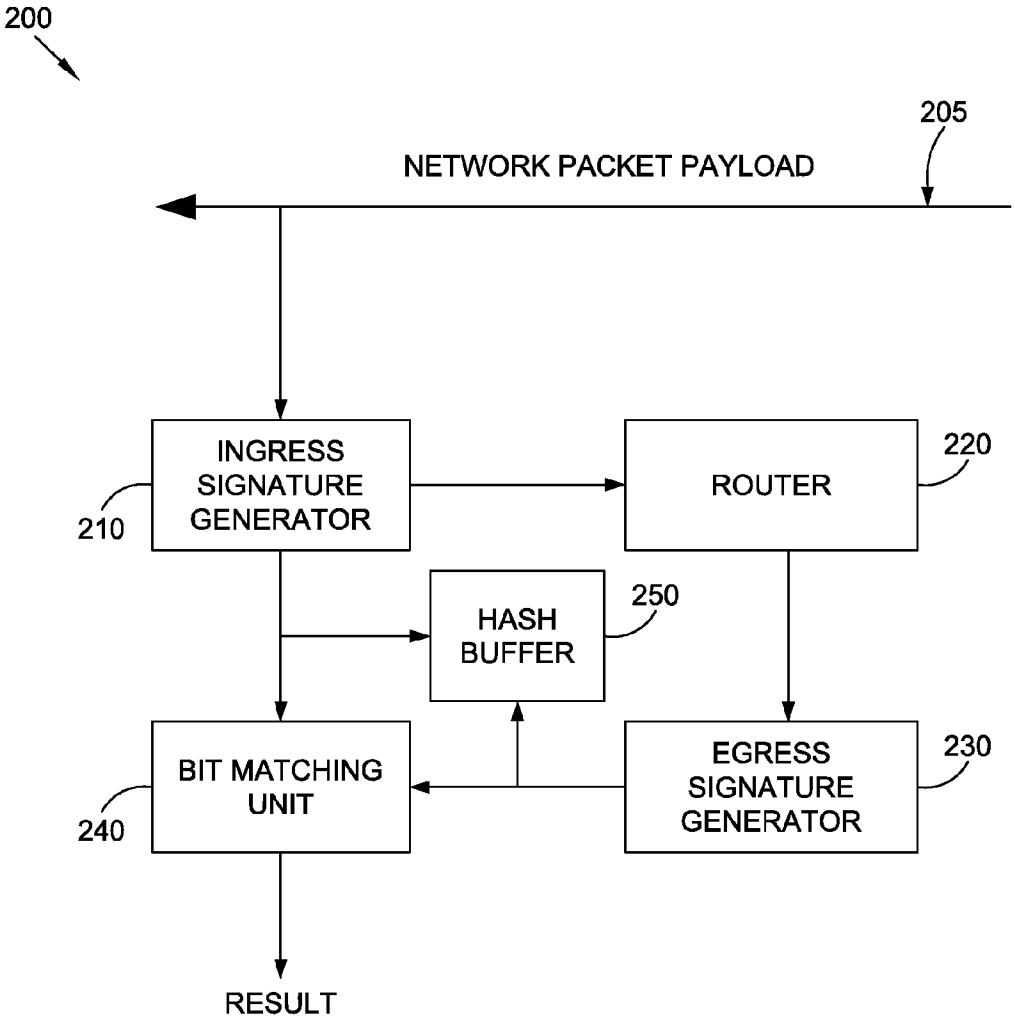

200
205
NETWORK PACKET PAYLOAD
INGRESS SIGNATURE GENERATOR
210
ROUTER
220
HASH BUFFER
250
BIT MATCHING UNIT
240
EGRESS SIGNATURE GENERATOR
230
RESULT

FIG. 2

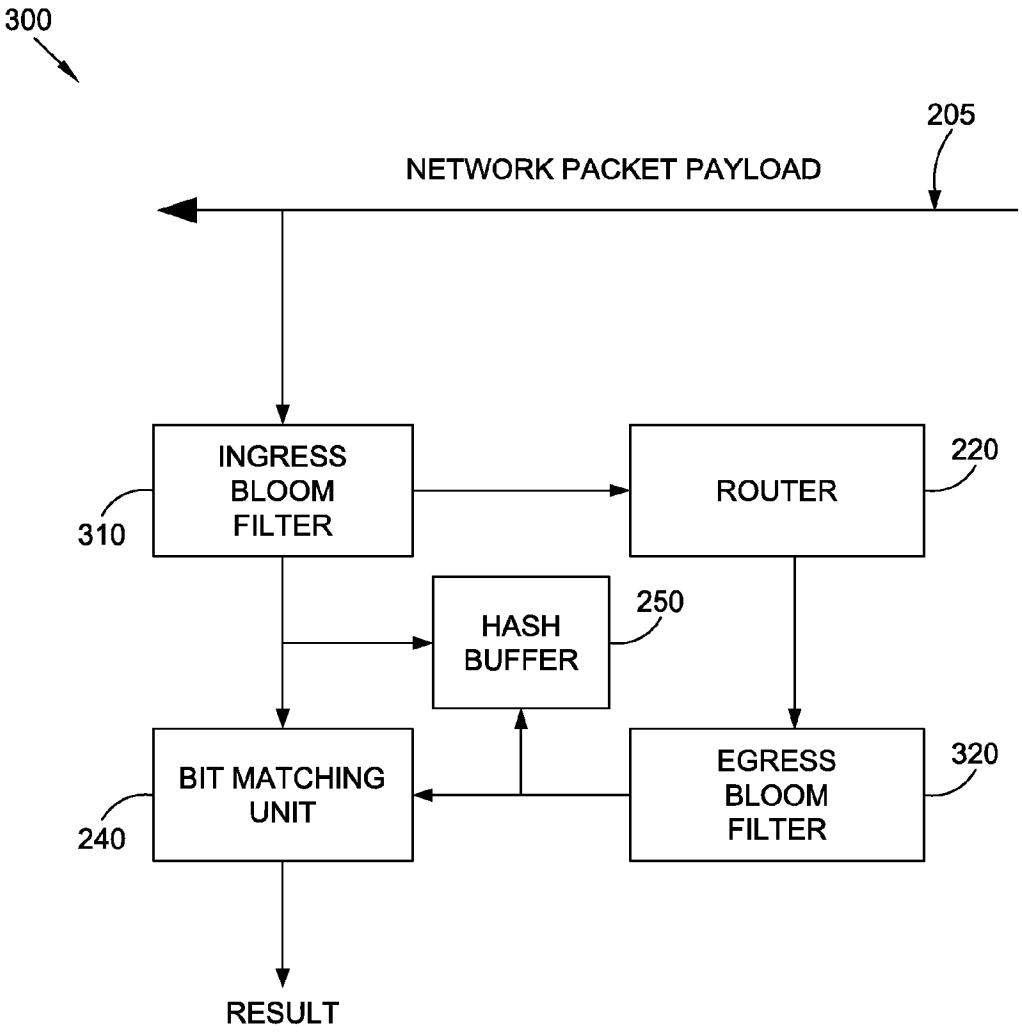

300
205
NETWORK PACKET PAYLOAD
INGRESS BLOOM FILTER
310
ROUTER
220
HASH BUFFER
250
BIT MATCHING UNIT
240
EGRESS BLOOM FILTER
320
RESULT

FIG. 3

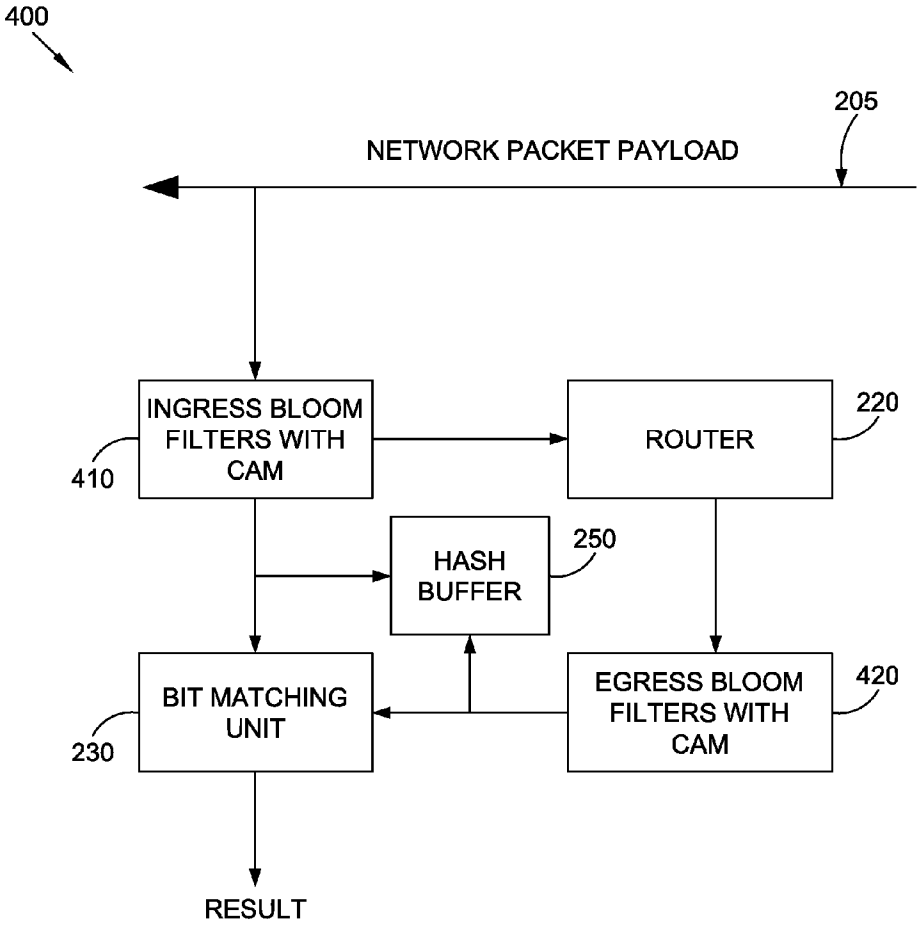

400
205
NETWORK PACKET PAYLOAD
INGRESS BLOOM FILTERS WITH CAM
410
ROUTER
220
HASH BUFFER
250
BIT MATCHING UNIT
230
EGRESS BLOOM FILTERS WITH CAM
420
RESULT

FIG. 4

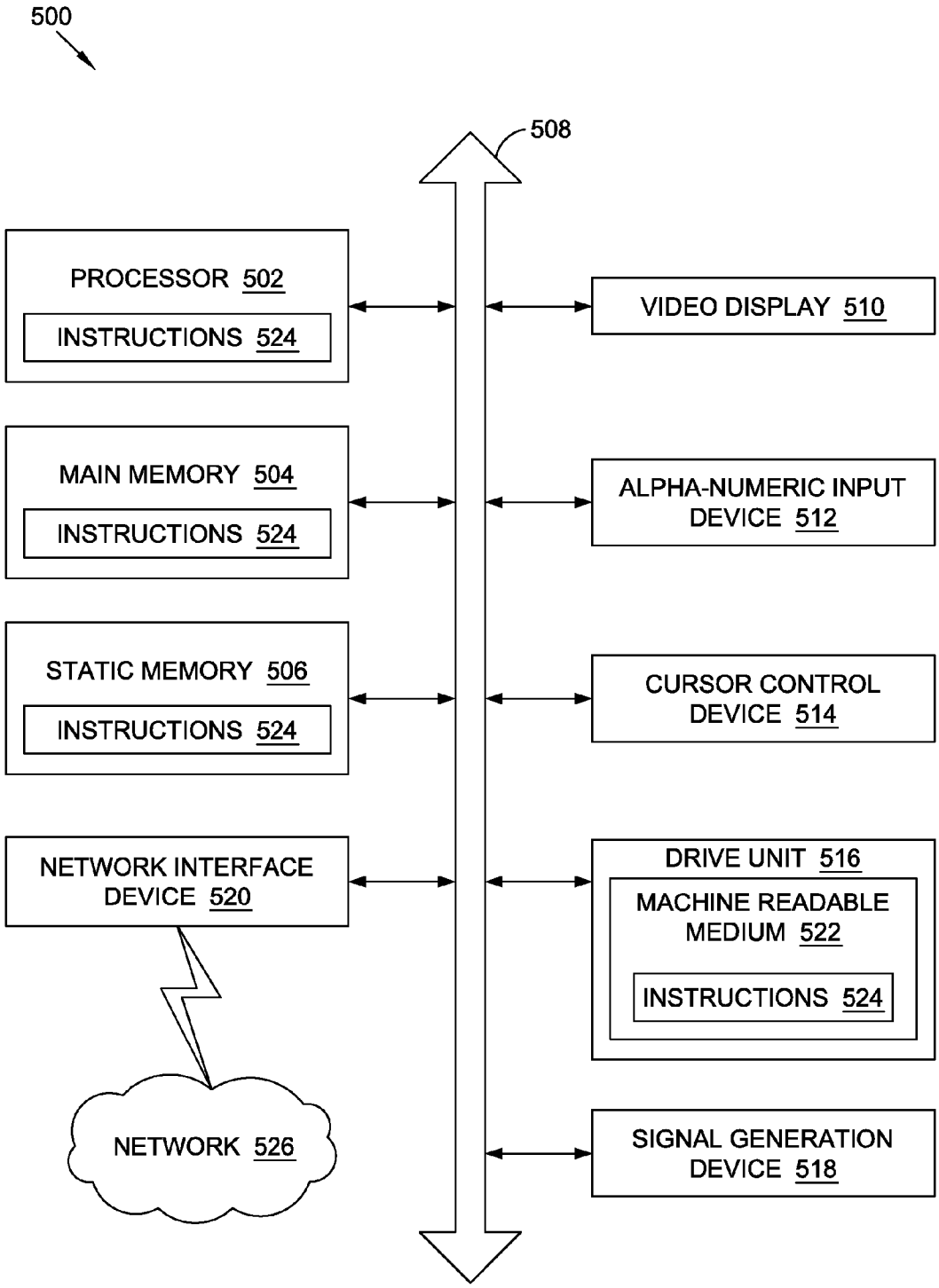

500
508
PROCESSOR 502
INSTRUCTIONS 524
MAIN MEMORY 504
INSTRUCTIONS 524
STATIC MEMORY 506
INSTRUCTIONS 524
NETWORK INTERFACE DEVICE 520
NETWORK 526
VIDEO DISPLAY 510
ALPHA-NUMERIC INPUT DEVICE 512
CURSOR CONTROL DEVICE 514
DRIVE UNIT 516
MACHINE READABLE MEDIUM 522
INSTRUCTIONS 524
SIGNAL GENERATION DEVICE 518

FIG. 5

METHOD AND APPARATUS FOR DETECTING MALICIOUS ROUTERS FROM PACKET PAYLOAD

FILED OF THE INVENTION

[0001] The present invention relates generally to computer and communication networks and more particularly relates to techniques for detecting malicious routers from packet payloads.

BACKGROUND

[0002] Network devices, such as switches and routers, are designed to forward network traffic, in the form of packets, at high line rates. One of the most important considerations for handling network traffic is packet throughput. To accomplish this, special-purpose processors known as network processors have been developed to efficiently process very large numbers of packets per second. In order to process a packet, the network processor (and/or network equipment employing the network processor) needs to extract data from the packet header indicating the destination of the packet, class of service, etc., store the payload data in memory, perform packet classification and queuing operations, determine the next hop for the packet, select an appropriate network port via which to forward the packet, etc. These operations are generally referred to as "packet processing" operations.

[0003] In addition to the foregoing packet forwarding operations, there may be a need to search packet payloads for a given string or set of strings. For example, security applications may need to search for certain strings indicative of a virus or Internet worm that is present in the packet payload, such as for load balancing or billing purposes.

[0004] The ever increasing number of computers, routers and connections marking up the Internet increases the number of vulnerable points from which these malicious individuals can launch attacks. These attacks can be focused on the Internet as a whole or on specific devices, such as hosts or computers, connected to the network. In fact, each router, switch, or computer connected to the Internet may be a potential entry point from which a malicious individual can launch an attack while remaining largely undetected. Attacks carried out on the Internet often consist of malicious packets being injected into the network. Malicious packets can be injected directly into the network by a computer, or a device attached to the network, such as a router or switch, can be compromised and configured to place malicious packets onto the network.

[0005] Searching packet payloads presents a problem with respect to line-rate packet forwarding. The reason for this is that string searches may be very time consuming, especially, if the strings are relatively long. With the network line-rates significantly increasing every year, it is becoming increasingly difficult for software and hardware based solutions to operate at these increasing line rates. Further, bulk of packets received by the routers are forwarded rather than consumed by them and given the increasing line-rates, detection of malicious packets can become extremely difficult.

[0006] Current techniques monitor signatures in a network payload by storing a predefined signature of a predetermined length. Further, a data stream on the network is monitored for a signature which corresponds to the predefined signature. Furthermore, using an analyzer, whether the network signature corresponds to the predefined signature and is a false positive is determined. These techniques are used for pattern matching applications, such as network security, application specific service differentiation, QoS enhancement and network engineering and so on. Further, such implementations can be very hardware intensive and an increase in the width of the data-bus to support counter-fields can result in noticeable speed reduction for a wide-bit vector. In addition, these techniques can require complicated application specific integrated circuit (ASIC) layout.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Example embodiments are illustrated by way of example and not limitation in the figures of the accompanying drawings, in which like references indicate similar elements and in which:

[0008] FIG. **1** is a process flow of detecting a malicious router during transmission of packet payload, according to one embodiment.

[0009] FIG. **2** is a block diagram illustrating using signature generators for detecting a malicious router during transmission of network packet payload, according to one embodiment.

[0010] FIG. **3** is a block diagram illustrating using Bloom filters for detecting a malicious router during transmission of network packet payload, according to one embodiment.

[0011] FIG. **4** is a block diagram illustrating using Bloom filters along with a Content Addressable Memory (CAM) for detecting a malicious router during transmission of network packet payload, according to one embodiment.

[0012] FIG. **5** is a diagrammatic system view of a data processing system in which any of the embodiments disclosed herein may be performed, according to one embodiment.

[0013] Other features of the present embodiments will be apparent from the accompanying drawings and from the detailed description that follows.

DETAILED DESCRIPTION

[0014] A method, an apparatus, and a system for detecting a malicious router during transmission of a network packet payload are disclosed. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the various embodiments. It will be evident, however, to one skilled in the art that the various embodiments may be practiced without these specific details.

[0015] The terms "search string", "string", and "packet" are used interchangeably throughout the document. Further, the terms "switch" and "router" are used interchangeably throughout the document. Furthermore, the terms "Bloom unit" and "Bloom filters" are used interchangeably throughout the document.

[0016] FIG. **1** is a process flow **100** illustrating detection of a router that is compromised and configured to place malicious packets on to a network packet payload, according to one embodiment. In operation **110**, hashing is performed on a current ingress packet received by a router via the network packet payload to generate associated ingress packet hash values. In some embodiments, the network packet payload arrives as TCP/IP data. In operation **120**, hashing is performed on a current egress packet to generate associated egress packet values substantially before the current egress

packet exits the router. In these embodiments, the current ingress packet that is leaving the router is named as the current egress packet.

[0017] In some embodiments, hashing is performed using a hash unit on each current ingress packet and current egress packet to generate respective ingress and egress packet hash values. In these embodiments, each of the ingress and egress packet hash values is stored in a hash buffer. In some embodiments, one or more packet hash values are generated based on variable-sized hash blocks of the current ingress packet and current egress packet. In these embodiments, a cluster of Bloom filters that is configured by trusted remote software, such as simple network management protocol (SNMP) management station, is used during switch boot-up time. The Bloom filters partition the current ingress packet and current egress packet into sub-packets where each sub-packet works on different portions of the current ingress packet and current egress packet, such as data-link header, Internet Protocol (IP) header, layer 4 headers, payload and so on to parallelize the operation. For example, each of the current ingress packet and current egress packet can have sub-packets of type H**2**, H**3**, H**4** and so on, wherein HX refers to the layer x header, with the possibility of one or more headers being absent. In these embodiments, each Bloom filter accepts as input associated sub-packets of the current ingress packet and current egress packet and performs hashing and outputs respective k hash values in the range of 1 to Ri.

[0018] In operation **130**, the generated ingress packet hash values and egress packet hash values are compared substantially after the current egress packet exits the router. In operation **140**, the process flow **100** determines whether the router is potentially compromised and configured to place malicious packets based on the outcome of the comparison at operation **130**. In some embodiments, in operation **140**, the process flow **100** determines whether the ingress packet hash values and the egress packet hash values are substantially different. In some embodiments, in operation **140**, the process flow **100** determines whether the ingress packet hash values and the egress packet hash values are same.

[0019] Based on the determination at operation **140**, the process flow **100** then goes to operation **160** and identifies the router as potentially compromised and configured to place the malicious packets in the network packet payload if the ingress packet hash values and the egress packet hash values are different. In operation **170**, an appropriate action is taken on the current egress packet upon identifying the router as potentially compromised and configured to place the malicious packets in the network packet payload. Exemplary appropriate actions include dropping the current egress packet, forwarding the current egress packet, logging the current egress packet and the like.

[0020] Based on the determination at operation **140**, the process flow **100** goes to operation **145** and determines if there is another packet in the network packet payload waiting to enter the router. Based on the determination at operation **145**, the process flow **100** goes to operation **110** and repeats operations **110**-**170** if there is another packet in the network packet payload waiting to enter the router. Based on the determination at operation **145**, the process flow **100** goes to operation **150** and ends the detection of whether the router is compromised and configured to place malicious packets in the network packet payload if there is no other packet waiting to enter the router.

[0021] In some embodiments, the ingress packet hash values and the egress packet hash values are stored in a hash buffer. The ingress packet hash values and the egress packet hash values are then rehashed to generate associated ingress and egress rehashed values. The ingress and egress rehashed values are then compared to determine whether they are substantially different. The router is then identified as potentially compromised and configured to place the malicious packets in the network packet payload if the ingress and egress rehashed values are found to be substantially different.

[0022] In some embodiments, the ingress packet hash values associated with the current ingress packet that assisted in determining whether the router is potentially compromised and configured is stored. The current ingress packet in the network packet payload is identified as a potentially malicious packet.

[0023] It can be see that the above-described technique includes determining the difference in the input-side finger-print (obtained by hashing each packet in a network packet payload at the input side of a router) and output-side finger-print (obtained by similarly hashing each associated packet at the output side of the router) to identify a malicious router. However, packets that are destined to be delivered to the router only (even though by hashing these packets can result in a difference between the input-side finger-print to the output-side finger-print) may not be hashed based on the router identifying datalink header, info/IP header info, and the like in each packet entering the router.

[0024] FIG. **2** is a block diagram illustrating using signature generators for detecting a malicious router during transmission of network packet payload, according to one embodiment. Particularly, FIG. **2** illustrates a system **200** that includes an incoming network packet payload **205**, an ingress signature generator **210**, a router **220**, an egress signature generator **230**, a bit matching unit **240**, and a hash buffer **250**. In operation, the ingress signature generator **210** receives a current ingress packet from a network packet payload and performs hash on the current ingress packet and generates respective ingress packet hash values substantially before entering the router **220**. The hash buffer **250** then stores the generated ingress packet hash values. The egress signature generator **230** receives a current egress packet that is associated with the current ingress packet and generates egress packet hash values substantially after exiting the router **220**. The bit matching unit **240** receives and compares the ingress packet hash values from the hash buffer **250** and the egress packet hash values from the egress signature generator **230** to determine whether the router is potentially compromised and configured to place malicious packets in the network packet payload.

[0025] In some embodiments, the bit matching unit **240** determines whether the ingress packet hash values and the egress packet hash values are substantially different. The bit matching unit **240** then identifies the router **220** as potentially compromised and configured to place the malicious packets in the network packet payload if the ingress packet hash values and the egress packet hash values are substantially different. The bit matching unit **240** takes appropriate action on the current egress packet upon identifying the router **220** as potentially compromised and configured to place the malicious packets in the network packet payload. The operation of the system **200** to identify a malicious router is explained in more detail with respect to FIG. **1**.

[0026] FIG. **3** is a block diagram illustrating using Bloom filters for detecting a malicious router during transmission of network packet payload, according to one embodiment. Particularly, FIG. **3** illustrates a system **300** that is similar to the system **200** shown in FIG. **2**, except that the system **300** uses egress and ingress Bloom filters **310** and **320** are in place of the ingress and egress signature generators **210** and **230** used in FIG. **2** for hashing the current ingress packet and he current egress packet. The operation of system **300** is similar to what is described for system **200** with reference to FIG. **2**.

[0027] FIG. **4** is a block diagram illustrating a system **400** that uses Bloom filters with Content Addressable Memory (CAM) units for detecting a malicious router during transmission of network packet payload, according to one embodiment. The system **400** in FIG. **4** is similar to the system **200** shown in FIG. **2**, except that in the system **400** uses egress and ingress Bloom filters with CAM units **410** and **420** in place of the ingress and egress signature generators **210** and **230**, respectively, for hashing the current ingress packet and the current egress packet. The operation of the system **400** is similar to what is described for the system **200** with reference to FIG. **2** except that the system **400** uses Bloom filters with CAM units **410** **420** to rehash the ingress packet hash values and the egress packet hash values.

[0028] FIG. **5** is a diagrammatic system view **500** of a data processing system in which any of the embodiments disclosed herein may be performed, according to one embodiment. Particularly, the diagrammatic system view of FIG. **5** illustrates a processor **502**, a main memory **504**, a static memory **506**, a bus **508**, a video display **510**, an alpha-numeric input device **512**, a cursor control device **514**, a drive unit **516**, a signal generation device **518**, a network interface device **520**, a machine readable medium **522**, instructions **524**, and a network **526**, according to one embodiment.

[0029] The diagrammatic system view **500** may indicate a personal computer and/or a data processing system in which one or more operations disclosed herein are performed. The processor **502** may be a microprocessor, a state machine, an application specific integrated circuit, a field programmable gate array, etc. (e.g., Intel® Pentium® processor). The main memory **504** may be a dynamic random access memory and/or a primary memory of a computer system. The static memory **506** may be a hard drive, a flash drive, and/or other memory information associated with the data processing system.

[0030] The bus **508** may be an interconnection between various circuits and/or structures of the data processing system. The video display **510** may provide graphical representation of information on the data processing system. The alpha-numeric input device **512** may be a keypad, keyboard and/or any other input device of text (e.g., a special device to aid the physically handicapped). The cursor control device **514** may be a pointing device such as a mouse. The drive unit **516** may be a hard drive, a storage system, and/or other longer term storage subsystem.

[0031] The signal generation device **518** may be a bios and/or a functional operating system of the data processing system. The network interface device **520** may perform interface functions (e.g., code conversion, protocol conversion, and/or buffering) required for communications to and from the network **526** between a number of independent devices (e.g., of varying protocols). The machine readable medium **522** may provide instructions on which any of the methods disclosed herein may be performed. The instructions **524** may provide source code and/or data code to the processor **502** to enable any one/or more operations disclosed herein.

[0032] For example, a storage medium having instructions, that when executed by a computing platform executes a method for detecting whether a router is compromised and configured to place malicious packets onto the network packet payload, includes performing hash on a current ingress packet received by the router via the network packet payload to generate ingress packet hash values, performing hash on a current egress packet to generate egress packet hash values substantially before exiting the router, wherein the current egress packet is associated with the current ingress packet, comparing the generated ingress packet hash values and the egress packet hash values substantially before the current egress packet exits the router, and determining that the router is potentially compromised and configured to place the malicious packets based on the outcome of the comparison.

[0033] The storage medium may have instructions to determine whether the ingress packet hash values and the egress packet hash values are substantially different, and if so, to identify the router as potentially compromised and configured to place the malicious packets in the network packet payload.

[0034] The storage medium may further have instruction to store the ingress packet hash values and egress packet hash values in a hash buffer, perform rehash on the ingress packet hash values and egress packet hash values to generate associated ingress and egress rehashed values, determine whether the ingress and egress rehashed values are substantially different, and if so to identify the router as potentially compromised and configured to place the malicious packets in the network packet payload.

[0035] Furthermore, a computer system includes a processing unit and a memory coupled to the processor. The memory has code stored therein for exact string matching in a network packet payload. The code causes the processor to perform hash on a current ingress packet received by the router via the network packet payload to generate ingress packet hash values, perform hash on a current egress packet to generate egress packet hash values substantially before exiting the router, wherein the current egress packet is associated with the current ingress packet, compare the generated ingress packet hash values and the egress packet hash values substantially before the current egress packet exits the router, and determine that the router is potentially compromised and configured to place the malicious packets based on the outcome of the comparison.

[0036] The above technique can be used to determine whether one router is sending routing updates to another router connected to the network. The above technique can also be used to determine whether a router forward traffic from source network A further upstream to a destination network B. Further, the above technique can be used to determine whether router A generates traffic claiming to be router B. Furthermore, the above technique can be used to determine whether a disproportionate amount of traffic is passing through a router X targeted at destination network Y. Moreover, the above technique can be used to determine whether a host H (nearest to a router X) is involved in a transmission control protocol sync (TCP SYN) attack or a Denial of Service (DoS) attack.

[0037] The above technique facilitates scaling to identify whether forwarding router is malicious. Further, the above technique can be designed to not to trust switch software

running above it. Furthermore, the above technique can be used to determine a wide variety of routing misbehaviors, such as packet tampering, packet dropping, packet creation and the like. Moreover, using the Bloom filters can yield a tamper-proof architecture that works well in a centralized network where a trusted SNMP management station can monitor the security of the network. In addition, it can be envisioned that the above technique can be used for detecting transmission of potentially malicious packets in packet payload.

[0038] In one embodiment, the above technique uses a counting Bloom filter, which is a variant to Bloom filters, which indexes into an array of a counter that counts packets (rather than a bit array) for each of the k hash outputs. Using such counting Bloom filters can allow counting multiplicities of events, and such data can be used for monitoring DoS attacks allowing cross verifying flow volumes across multiple routers and the like.

[0039] In another embodiment, the above technique uses Bloom filters that are configured by trusted remote software, such as an SNMP management station, during switch boot-up time. In these embodiments, each search sting is broken into sub search-strings that are associated with different portions of a search string, such as data-link header, Internet protocol (IP) header, layer 4 header, payload and so on to maximize parallelism. Further, each search string can be considered to include a string of type H_2, H_3, H_4, Payload and so on), where H_X refers to a layer X header.

[0040] It is possible that one or more headers can be absent in a search string. In these embodiments, each Bloor filter accepts as input the relevant sub-portion of a search string as input and returns k values in the range of 1 to Ri. The Bloom filter then increments k counter locations in a dedicated memory counter array, such as a static random access memory (SRAM) counter array. The associated counters are then indexed by the values output by the Bloom filter to represent each search string on the forwarding path by a set of k unique locations which are in turn incremented in the memory counter array.

[0041] It can be seen that the SRAM counter array can be tamper-proof and difficult to manipulate or modify by the router firmware. The Bloom filter logging unit is generally a very secure unit and can only be configured/polled from a network management station using a secure authentication-based protocol. Also it can be seen that the raw counter-arrays cannot be sent to the firmware as the router software can be untrustworthy and the compromised router can manipulate the counter array information. This can be overcome by sending an encrypted version of the counter-arrays using a key that can be shared between the secure hardware and the management station. This encrypted counter-arrays information can be securely transferred to the network management station using a standard secure interface such as SNMP trap.

[0042] Another aspect of the above technique is that the Bloom filter search strings assume that the firmware is untrustworthy and its counter array log serves as a non-repudiatable proof of having seen the search strings that match particular patterns. Since firmware in router is generally untrustworthy, the above technique provides in-built support for hardware symmetric key encryption in the Bloom unit so that only encrypted information can be transferred from the Bloom unit to the master CPU before it is transferred to the management station.

[0043] In some embodiments, packets are logged on the ingress side of each switch and relay the encrypted counter array logs to the network management station, substantially subsequent to which the counter array is reset to all-zeros. The relaying of information can be done using a push-based protocol where each node can periodically send updates to the management station or a pull-based protocol where the management host can query the router for updated logs.

[0044] In another embodiment, the above technique checks whether the incoming packets are being modified using a forwarding router without having to rely on the packets having to be sent securely to a management station. In these embodiments, each incoming packet (generated by the switch that do not have the switch as the source address) is passed through two Bloom filters, i.e., one Bloom filter located at the input side of the router and the other located on the output side of the Bloom filter, as shown in FIGS. **3** and **4**, and logged in associated scratchpad SRAM counter arrays. The input and output side Bloom filter counter arrays are then periodically compared against each other. Based on the comparison, if any of the bits in the input and output side Bloom filter counter arrays are found to be set then it can be inferred that the forwarding router could be modifying the contents in the packets on the forwarding path. This could in turn be set to cause a trap to be generated to the management host to indicate the possibility of a compromised router. In these embodiments, the verification of the valid behavior of the forwarding router can be done by a trusted hardware without having to rely on the network management host. It can be envisioned that different routers can be queried by the management station for sophisticated attacks involving the need to cross verify bit array logs of multiple routers.

[0045] In some embodiments, the above two techniques are combined to determine whether a router is compromised and configured to place malicious packets in the network. For example, the router can include 2 Bloom filters as described above (i.e., one on the ingress side and the other on the egress side of the router). The counter vectors on the input side and the output side can be periodically compared and if any significant variations in the counter values or the number of patters are found based on the comparison, then the router can be identified as compromised and configured to place malicious packets in the network. It can be seen that the change in counter values can also be due to 2 Bloom filters being not synchronized even when a router is operating normally because the packets in a network packed payload can be queued up inside a router that have passed through the input Bloom filters but not yet reached the output bloom filters.

[0046] It can be seen that positioning of the Bloom filters in the switch can affect the bits that are set in the SRAM bit-arrays. Especially, if the Bloom filters are located substantially just after the ingress buffers, it can only log traffic on the forwarding path. However, it can be seen that if the Bloom filters are located substantially before the egress buffers, the router can log forwarding-path traffic as well as traffic generated by the switch firmware.

[0047] It can also be seen the width of the bit array m and the number of hash functions k can be design parameters for hardware Bloom units. Even though bloom filters can use entire width of the bit array (i.e., 0 to m-1), each of the k hash units of a Bloom filter can operate exclusively on a specific non-overlapping portion of the data and in turn can update contents of specific non-overlapping sub-range of the counter array.

[0048] It can be envisioned that the above technique allows masking certain bits in a search string header that are likely to be modified on a fast path account modification and can use the same hash functions across multiple boxes, i.e., can be enforced such that the same search string can almost always tag to the associated bit. For example, certain fields in a packet are generally modified by a router during packet forwarding. This is in accordance with the routing Request for comments (RFC). In such a scenario, these fields are masked by using bit-masks so that they do not look like modified packets to the router, otherwise the router will flag them as malicious.

[0049] This can allow an IP router to ignore certain fields, such as the TTL (Time To Live) that are updated in the router on the forwarding path to comply with standards, such as RFC (Request for Comments).

[0050] In some embodiments, the log information obtained by the above technique is transferred when a management stations queries the Bloom unit associated with a router. In these embodiments, the management station sends a request to Bloom software module that resides in the un-trusted firmware of the router. The software module then uses a standard API (Application Programming Interface) to request the current contents of the counter array from the Bloom unit. The Bloom unit upon receiving the request uses its hardware encryption unit to encrypt the counter array using its shared key with the management station. The encrypted string is then returned to the un-trusted firmware, which in turn forward the packet to the management station. The management station then uses the shared key to decrypt the content of the received message and retrieves the counter arrays of the router.

[0051] Also, the above-described method may be in a form of a machine-readable medium embodying a set of instructions that, when executed by a machine, causes the machine to perform any method disclosed herein. It will be appreciated that the various embodiments discussed herein may not be the same embodiment, and may be grouped into various other embodiments not explicitly disclosed herein.

[0052] In addition, it will be appreciated that the various operations, processes, and methods disclosed herein may be embodied in a machine-readable medium and/or a machine accessible medium compatible with a data processing system (e.g., a computer system), and may be performed in any order (e.g., including using means for achieving the various operations). Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

What is claimed is:

1. A method of detecting whether a router is compromised and configured to place malicious packets onto the network, comprising:

performing hash on a current ingress packet received by the router via the network packet payload to generate ingress packet hash values;

performing hash on a current egress packet to generate egress packet hash values substantially before exiting the router, wherein the current egress packet is associated with the current ingress packet;

comparing the generated ingress packet hash values and the egress packet hash values substantially before the current egress packet exits the router; and

determining that the router is potentially compromised and configured to place the malicious packets based on the outcome of the comparison.

2. The method of claim **1**, wherein determining that the router is potentially compromised and configured comprises:

determining whether the ingress packet hash values and the egress packet hash values are substantially different; and

if so, then identifying the router as potentially compromised and configured to place the malicious packets in the network packet payload.

3. The method of claim **1**, further comprising:

storing the ingress packet hash values and egress packet hash values in a hash buffer;

performing rehash on the ingress packet hash values and egress packet hash values to generate associated ingress and egress rehashed values;

determining whether the ingress and egress rehashed values are substantially different; and

if so, then identifying the router as potentially compromised and configured to place the malicious packets in the network packet payload.

4. The method of claim **1**, further comprising:

repeating the steps of performing hash on the current ingress packet, performing hash on the current egress packet, comparing, and determining on a next packet in the network packet payload.

5. The method of claim **1**, wherein performing hash on a current ingress packet received via the network packet payload to generate ingress packet hash values and performing hash on a current egress packet to generate egress packet hash values comprises:

employing a plurality of Bloom filters to perform hash on the current ingress packet received via the network packet payload to generate ingress packet hash values and to perform hash on the current egress packet to generate egress packet hash values.

6. The method of claim **1**, further comprising:

taking an appropriate action on the current egress packet in the network packet payload upon identifying the router as potentially compromised and configured to place the malicious packets and wherein the appropriate action includes dropping the current egress packet, forwarding the current egress packet and logging the current egress packet.

7. The method of claim **1**, wherein the network packet payload arrives as TCP/IP data.

8. The method of claim **1**, wherein performing hash on a current ingress packet and performing hash on a current egress packet comprises:

performing hash on variable-sized blocks in the current ingress packet to generate respective ingress packet hash values; and

performing hash on variable-sized blocks in the current egress packet to generate respective egress packet hash values.

9. The method of claim **1**, further comprising:

storing the ingress packet hash values associated with the current ingress packet used in determining whether the router is potentially compromised and configured; and

identifying the current ingress packet in the network packet payload as a potentially malicious packet.

10. An article, comprising:

a storage medium having instructions, that when executed by a computing platform, result in execution of a method of detecting whether a router is compromised and configured to place malicious packets onto the network, comprising:

performing hash on a current ingress packet received by the router via the network packet payload to generate ingress packet hash values;

performing hash on a current egress packet to generate egress packet hash values substantially before exiting the router, wherein the current egress packet is associated with the current ingress packet;

comparing the generated ingress packet hash values and the egress packet hash values substantially before the current egress packet exits the router; and

determining that the router is potentially compromised and configured to place the malicious packets based on the outcome of the comparison.

11. The article of claim **10**, wherein determining that the router is potentially compromised and configured comprises:

determining whether the ingress packet hash values and the egress packet hash values are substantially different; and

if so, then identifying the router as potentially compromised and configured to place the malicious packets in the network packet payload.

12. The article of claim **10**, further comprising:

storing the ingress packet hash values and egress packet hash values in a hash buffer;

performing rehash on the ingress packet hash values and egress packet hash values to generate associated ingress and egress rehashed values;

determining whether the ingress and egress rehashed values are substantially different; and

if so, then identifying the router as potentially compromised and configured to place the malicious packets in the network packet payload.

13. The article of claim **10**, further comprising:

repeating the steps of performing hash on the current ingress packet, performing hash on the current egress packet, comparing, and determining on a next packet in the network packet payload.

14. The article of claim **10**, further comprising:

taking an appropriate action on the ingress packet in the network packet payload upon identifying the router as potentially compromised and configured to place the malicious packets and wherein the appropriate action is selected from the group consisting of dropping the packet, forwarding the packet and logging the packet.

15. A system for detecting a malicious router, comprising:

ingress signature generator configured to receive a current ingress packet in a network packet payload and perform hash on the current ingress packet and generate ingress packet hash values substantially before entering a router;

a hash buffer to store the generated ingress packet hash values;

egress signature generator configured to receive a current egress packet that is associated with the current ingress packet and generate egress packet hash values substantially after exiting the router; and

a bit matching unit coupled to the ingress signature generator, the egress signature generator, and the hash buffer to receive and compare the ingress packet hash values and egress packet hash values, respectively, and determine whether the router is potentially compromised and configured to place malicious packets based on the outcome of the comparison.

16. The system of claim **15**, wherein the bit matching unit determines whether the ingress packet hash values and the egress packet hash values are substantially different and wherein the bit matching unit identifies the router as potentially compromised and configured to place the malicious packets in the network packet payload if the ingress packet hash values and the egress packet hash values are substantially different.

17. The system of claim **15**, wherein the ingress signature generator and egress signature generator each comprises signature generators selected from a group consisting of a plurality of Bloom filters, a plurality of Bloom filters with bit counters and a plurality of Bloom filters with a CAM.

18. The system of claim **15**, wherein the bit matching unit takes an appropriate action on the current egress packet upon identifying the router as potentially compromised and configured to place the malicious packets.

19. The system of claim **15**, wherein the network packet payload arrives as TCP/IP data.

* * * * *

EXHIBIT 3

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(54) **METHOD, DEVICE, AND SYSTEM FOR MONITORING A SECURITY NETWORK INTERFACE UNIT**

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(57) **ABSTRACT**

The invention relates to a method for monitoring a security network interface unit (**23**), FIG. **2** for example a firewall, which receives a stream of data packets via a first interface (**21**), checks said data stream with respect to filtering rules, and outputs said data stream to a second interface (**22**). The method has the steps of duplicating and outputting the data stream to the second interface (**22**), checking the output data stream for inadmissible data traffic, transmitting a warning message to the security network interface unit if inadmissible data traffic is detected in the data stream, and restricting the data stream by means of the security network interface unit if the warning message is received in the security network interface unit (**23**). The device or the system according to the invention comprises units which are designed to carry out the aforementioned method.

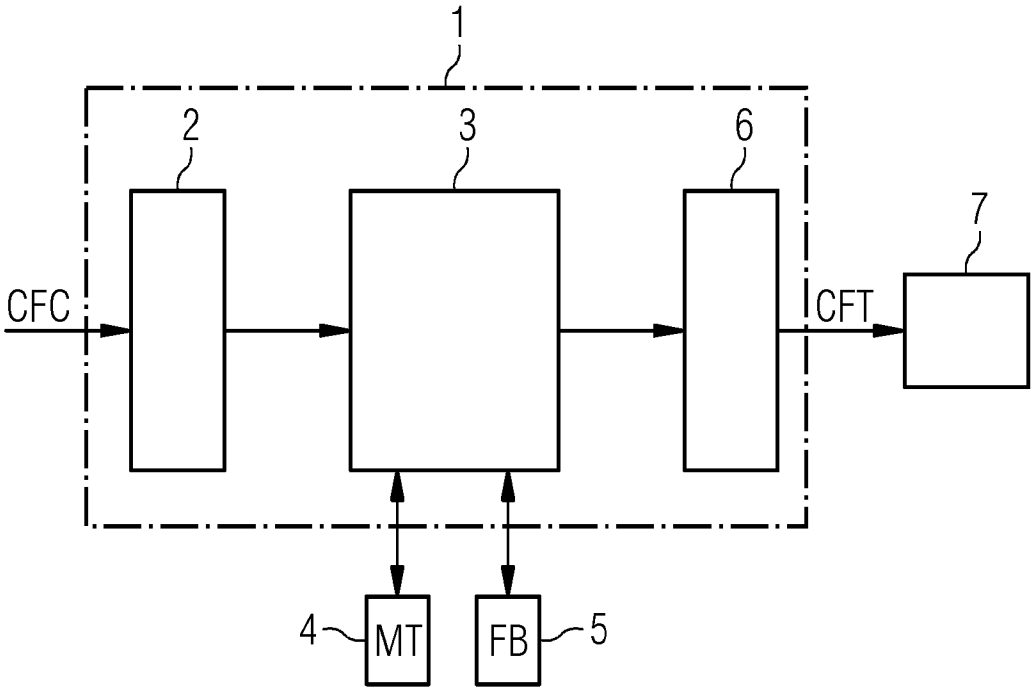


FIG 1

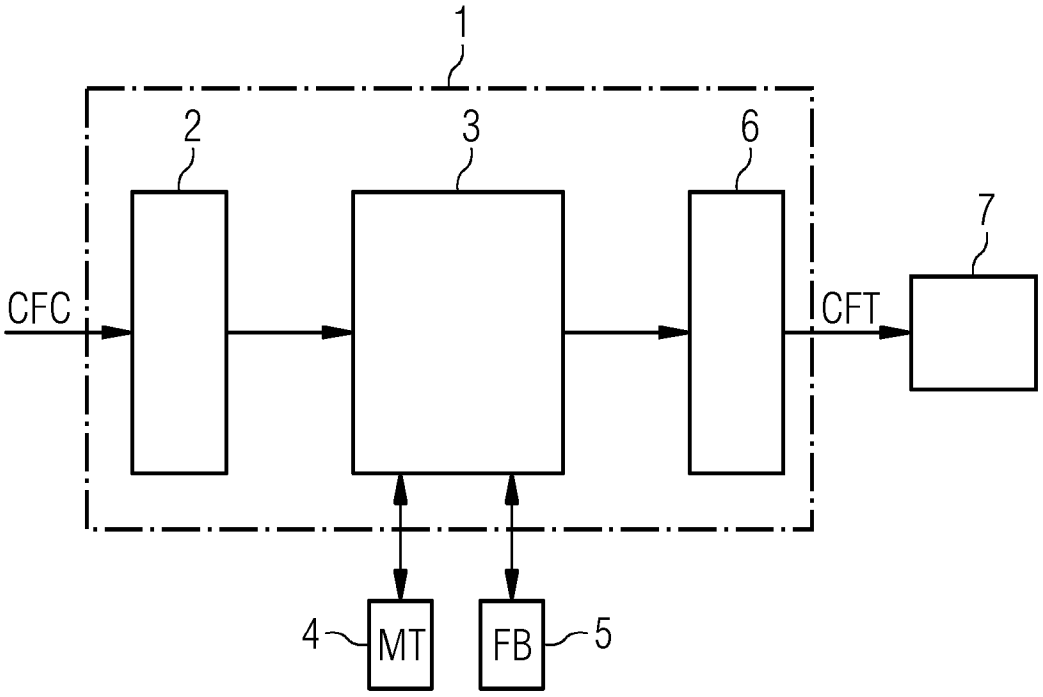
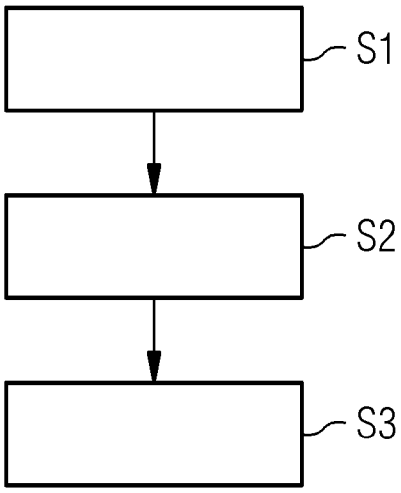


FIG 2



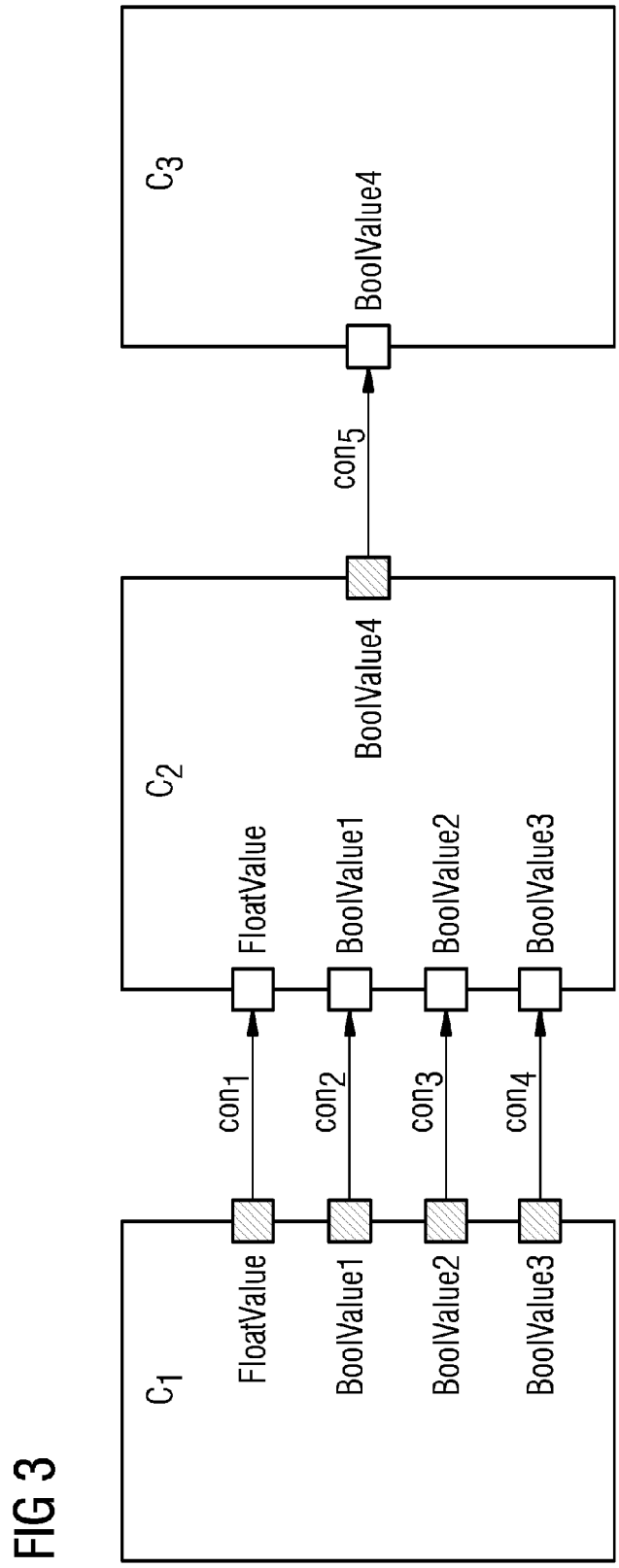

C1
FloatValue
BoolValue1
BoolValue2
BoolValue3
con1
con2
con3
con4
C2
FloatValue
BoolValue1
BoolValue2
BoolValue3
BoolValue4
con5
C3
BoolValue4

FIG 3

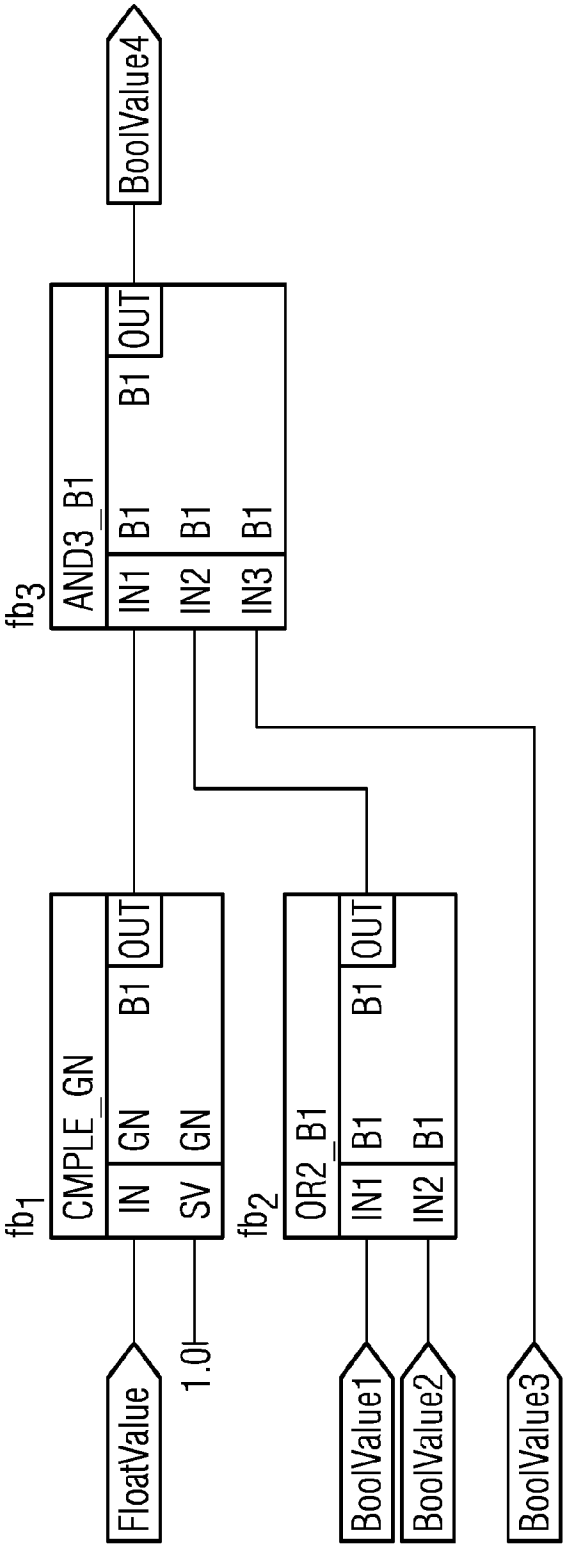

BoolValue4
fb3
AND3_B1
IN1
IN2
IN3
B1
B1
B1
B1
OUT
fb1
CMPLE_GN
IN
SV
GN
GN
B1
OUT
fb2
OR2_B1
IN1
IN2
B1
B1
B1
OUT
FloatValue
1.0f
BoolValue1
BoolValue2
BoolValue3

FIG 4

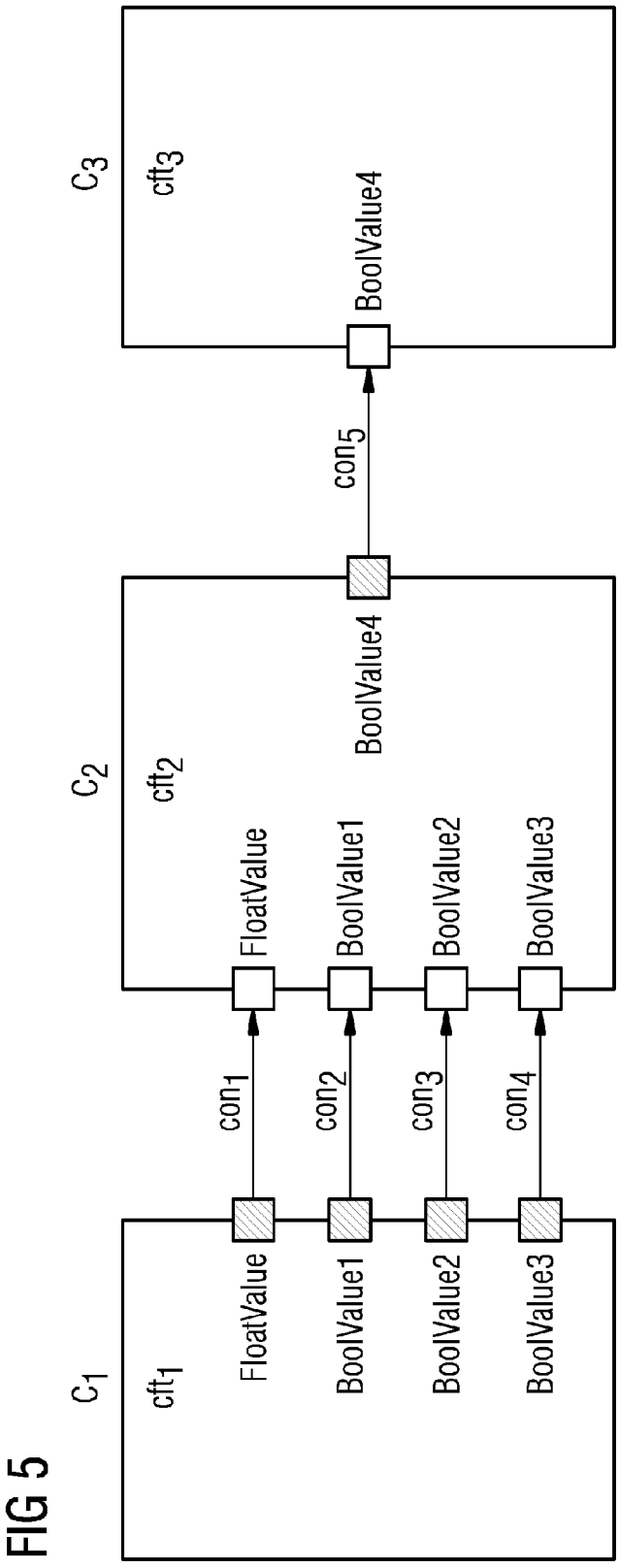

C1
cft1
FloatValue
BoolValue1
BoolValue2
BoolValue3
con1
con2
con3
con4
C2
cft2
FloatValue
BoolValue1
BoolValue2
BoolValue3
BoolValue4
con5
C3
cft3
BoolValue4

FIG 5

FIG 6

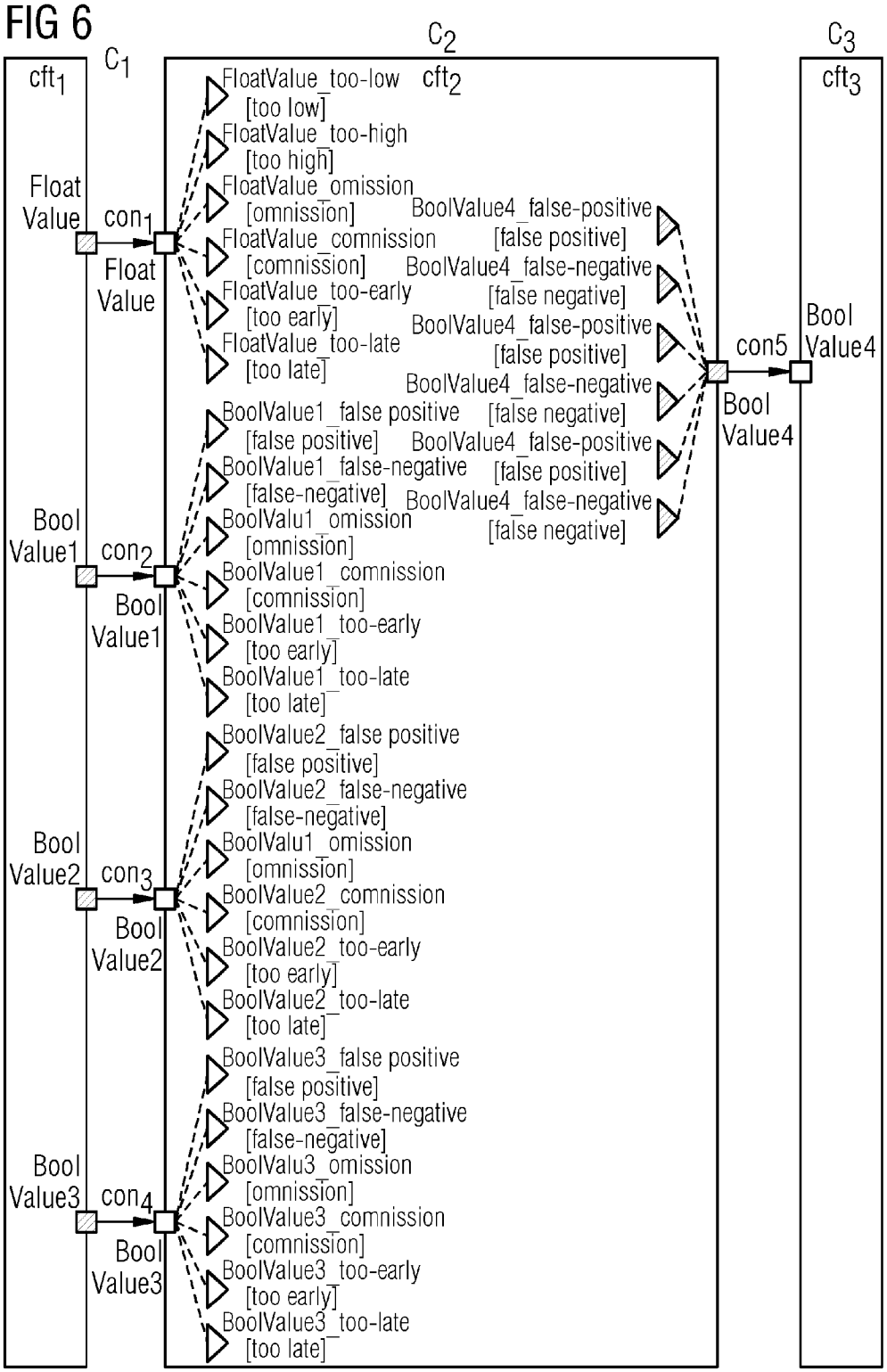
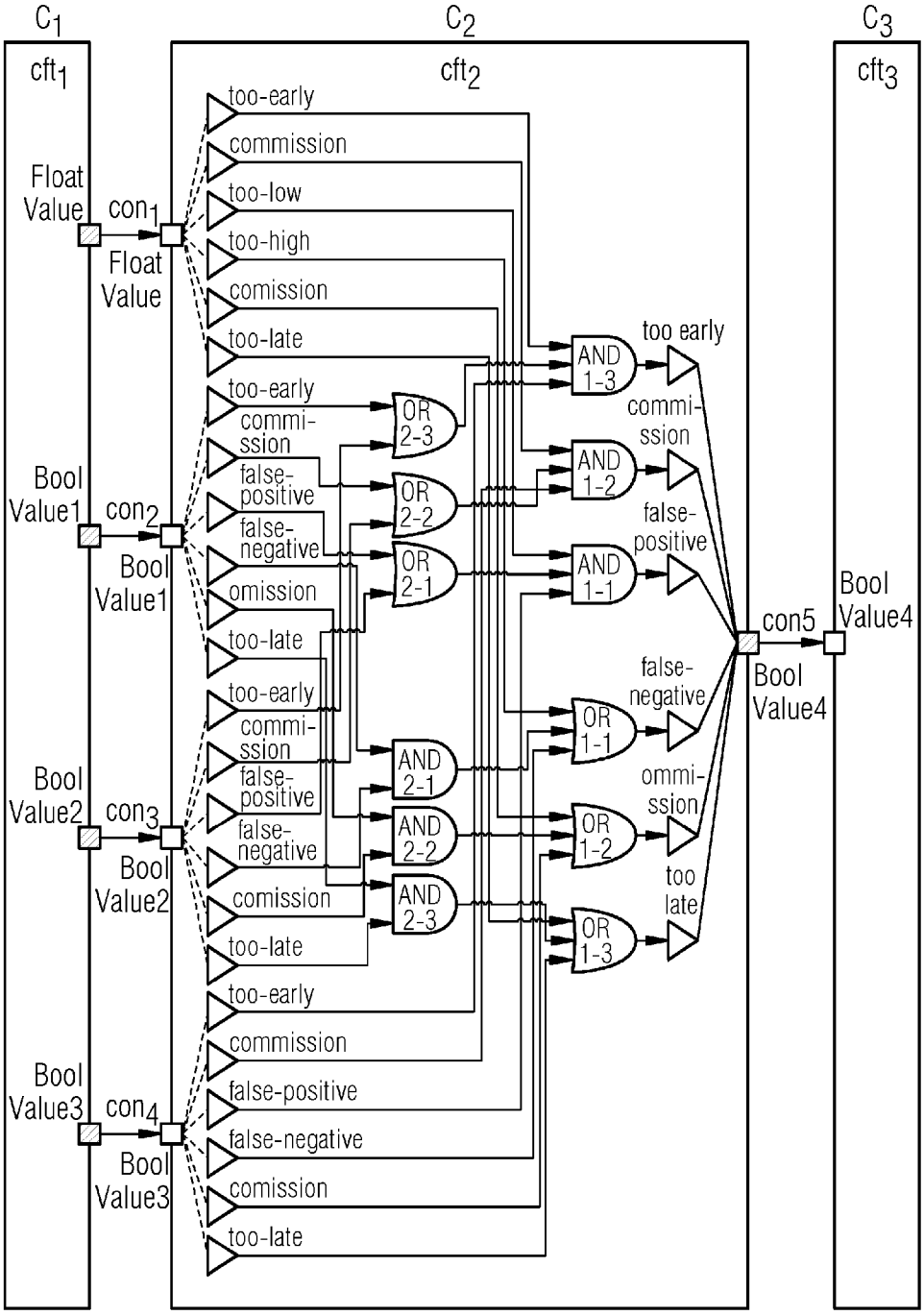

C1
C2
C3
cft1
cft2
cft3
Float Value
con1
Float Value
Bool Value1
con2
Bool Value1
Bool Value2
con3
Bool Value2
Bool Value3
con4
Bool Value3
con5
Bool Value4
Bool Value4
FloatValue_too-low [too low]
FloatValue_too-high [too high]
FloatValue_omission [omnission]
FloatValue_comnission [comnission]
FloatValue_too-early [too early]
FloatValue_too-late [too late]
BoolValue1_false positive [false positive]
BoolValue1_false-negative [false-negative]
BoolValu1_omission [omnission]
BoolValue1_comnission [comnission]
BoolValue1_too-early [too early]
BoolValue1_too-late [too late]
BoolValue2_false positive [false positive]
BoolValue2_false-negative [false-negative]
BoolValu1_omission [omnission]
BoolValue2_comnission [comnission]
BoolValue2_too-early [too early]
BoolValue2_too-late [too late]
BoolValue3_false positive [false positive]
BoolValue3_false-negative [false-negative]
BoolValu3_omission [omnission]
BoolValue3_comnission [comnission]
BoolValue3_too-early [too early]
BoolValue3_too-late [too late]
BoolValue4_false-positive [false positive]
BoolValue4_false-negative [false negative]
BoolValue4_false-positive [false positive]
BoolValue4_false-negative [false negative]
BoolValue4_false-positive [false positive]
BoolValue4_false-negative [false negative]

FIG 7


C1
cft1
Float Value
con1
Float Value
Bool Value1
con2
Bool Value1
Bool Value2
con3
Bool Value2
Bool Value3
con4
Bool Value3
C2
cft2
too-early
commission
too-low
too-high
comission
too-late
too-early
commi-ssion
false-positive
false-negative
omission
too-late
too-early
commi-ssion
false-positive
false-negative
comission
too-late
too-early
commission
false-positive
false-negative
comission
too-late
OR 2-3
OR 2-2
OR 2-1
AND 2-1
AND 2-2
AND 2-3
AND 1-3
AND 1-2
AND 1-1
OR 1-1
OR 1-2
OR 1-3
too early
commi-ssion
false-positive
false-negative
ommi-ssion
too late
con5
Bool Value4
C3
cft3
Bool Value4

METHOD, DEVICE, AND SYSTEM FOR MONITORING A SECURITY NETWORK INTERFACE UNIT

[0001] This application is the National Stage of International Application No. PCT/EP2014/065714, filed Jul. 22, 2014, which claims the benefit of German Patent Application No. DE 10 2013 216 847.0, filed Aug. 23, 2013. The entire contents of these documents are hereby incorporated herein by reference.

TECHNICAL FIELD

[0002] The present embodiments relate to monitoring a network gateway unit.

BACKGROUND

[0003] Security network gateway units (e.g., firewalls) are installed at network boundaries in order to couple differently critical network areas in a controlled manner. The data traffic is filtered in this case, with the result that only permissible data traffic is let through. In industrial automation systems (e.g., a signal tower or a train controller in railway automation), in production halls in manufacturing automation, or in refineries or breweries in process automation, automation areas that are critical with regard to security are coupled to general networks (e.g., an office network). For this purpose, security gateways or firewalls are used and configured such that only authorized data traffic may pass through.

[0004] In this case, the data stream is filtered according to configurable filtering rules. Owing to errors in an implementation of the security network gateway unit or owing to errors in configuration, such as filtering rules, or else as a result of the security network gateway unit being compromised by an attack on the gateway unit itself, a security network gateway unit may operate incorrectly and let impermissible data packets through.

[0005] Some shortcomings of a security network gateway unit have been reduced by connecting a plurality of security network gateway units (e.g., a plurality of firewalls) in series. Network gateway units from different manufacturers may be used. However, this has the disadvantage that the delay and the jitter is increased as a result of longer processing times; therefore, the requirements for real-time communication are not met.

[0006] The filtering rules are to be continuously updated in a security network gateway unit in order to be able to provide protection, such as against new attacks (e.g., caused by viruses or worms). In some industrial automation environments, high demands are imposed on the integrity, with the result that the security network gateway units and the filtering rules implemented therein are to be authorized, and it is not permissible to change or update the configuration of the security network gateway units, the filtering rules, or the antivirus software. It is also to be provided that the data stream is not changed by a security network gateway unit to the automation network (e.g., no additional data packets are fed into the automation network by the network gateway unit).

[0007] For example, application number DE 10 2011 007 387 discloses self-monitoring of a security network gateway unit. In this application, a check is carried out in order to determine whether a corresponding incoming data packet has been received for an outgoing data packet, making it possible to provide that a network gateway unit does not itself generate data packets in the event of a malfunction.

SUMMARY AND DESCRIPTION

[0008] The scope of the present invention is defined solely by the appended claims and is not affected to any degree by the statements within this summary.

[0009] The present embodiments may obviate one or more of the drawbacks or limitations in the related art. For example, the present embodiments provide a method, a device, and a system that reliably filter impermissible data traffic in a transition to a security-relevant data network and provides data integrity in the security-relevant data network in the case of a defective security network gateway unit. In this case, the present embodiments provide absence of a reaction of the security network gateway unit (e.g., additional data packets may not be introduced into the security network by the security network gateway unit).

[0010] In one or more of the present embodiments, a method for monitoring a security network gateway unit (e.g., for example a firewall) is provided. The security network gateway unit receives a stream of data packets via a first interface, checks this data stream with respect to filtering rules and outputs the stream of data packets to a second interface. The method includes the acts of duplicating and outputting the data stream at the second interface, checking the output data stream for impermissible data traffic, transmitting a warning message to the security network gateway unit if impermissible data traffic is detected in the data stream, and restricting the data stream by the security network gateway unit if the warning message is received in the security network gateway unit.

[0011] Because the data stream is tapped off at the second interface that is downstream of the security network gateway unit and is within the security-relevant data network, a malfunction of the security network gateway unit may be detected by checking this filtered data stream. Another advantage is that, in the case of such a suspicion, the security network gateway unit is informed of the suspicion and may promptly initiate measures for restricting the data stream. In this case, messages are prevented from being introduced into the security-relevant data network itself (e.g., into the second interface) because the data stream is only restricted by the security network gateway unit (e.g., a firewall) as a consequence of the suspicion being reported. Therefore, a security network gateway unit that requires authorization or is certified, for example, may be monitored by updated filtering software in a monitoring unit without having to adapt, and therefore reauthorize or certify, the configuration or the software version of the network gateway unit itself. If impermissible data traffic is indicated, the data traffic is restricted by the security network gateway unit. The security network gateway unit may take suitable measures (e.g., as a result of additional information in the warning message) based on the additional information.

[0012] In one embodiment, the method includes the additional method acts of duplicating and outputting the data stream at the first interface, comparing the data stream at the first interface with the data stream at the second interface, and transmitting a warning message to the security network gateway unit if the data stream from the second interface differs from the data stream from the first interface.

[0013] This embodiment may have the advantage that impermissible data traffic successfully averted by the security network gateway unit is also detected. In this case, based on specifications made, a change may be made to a restrictive operating mode of the security network gateway unit (e.g., a

firewall). As a result, it is also detected if new data packets that were not present at the first interface are introduced into the security-relevant data network, and the data stream is immediately restricted by the security network gateway unit.

[0014] In one embodiment, the data stream is restricted by activating replacement filtering rules of the security network gateway unit. Therefore, for example, coordinated and authorized filtering rules or restrictive filtering rules for a restricted mode may be defined in advance, and these rules may be immediately activated if impermissible data entry to the security-relevant data network is suspected.

[0015] The risk may therefore be quickly averted with the limited downtime of the network gateway.

[0016] In one embodiment, the data stream is restricted by restarting the security network gateway unit with protected boot software, by restarting the security network gateway unit with replacement firmware, or by changing from an active virtual machine to a replacement virtual machine in a firewall.

[0017] Restarting the security network gateway unit may make it possible to reverse manipulation of the software of the network gateway unit because the software is changed to an initial starting state again during a restart. In the case of embedded systems, a restart may be reset with replacement firmware that either corresponds to the starting state of the original network gateway unit or includes stricter filtering rules. The replacement firmware may be stored in a read only memory or in a flash memory that may not be modified during normal operation of the firewall. When a security network gateway unit is implemented in the form of a virtual machine, a corresponding effect may be achieved by changing from an active virtual machine to a replacement virtual machine In this case, the downtimes during the change are particularly short. The data traffic to the security-relevant data network is therefore interrupted only very briefly.

[0018] In another embodiment, the data stream is restricted by deactivating the second interface and/or by deactivating the first interface of the firewall.

[0019] If the second interface is deactivated, it is provided that no further data may enter the security network. Deactivating the first interface of the network gateway unit avoids overflowing of the filters or damage to the security network gateway unit as a result of the arriving data stream.

[0020] In another embodiment, the data stream is restricted by deactivating a power supply of the security network gateway unit.

[0021] A physical interruption of the data stream beyond the network boundary is provided. This measure has the advantage that the measure may be used for any security network gateway unit irrespective of available or unavailable ways for restricting data at the network gateway unit. This provides, with very high reliability, that no data communication takes place via the security network gateway unit. This also makes it possible to achieve the situation in which log data possibly permanently stored on the security network gateway unit and the software version are available for subsequent evaluation (e.g., log data and the software version are not overwritten or deleted).

[0022] In one embodiment, the restriction of the security network gateway unit remains active as long as the warning message is received at the firewall.

[0023] This has the advantage that, after the security gap has been rectified, data communication may be immediately activated again beyond the network boundary. Downtimes are therefore minimized.

[0024] In another embodiment, the restriction of the network gateway unit remains active until an explicit signal for canceling the restriction (e.g., as a result of an action by administration personnel) is received at the security network gateway unit.

[0025] This has the advantage that the network gateway unit becomes operational again only after the defect has been rectified or after carrying out all desired measures. In one embodiment, a local input interface (e.g., a pushbutton or a key switch) is provided on the security network gateway unit for this purpose.

[0026] The device according to an embodiment is provided for monitoring a security network gateway unit that receives a stream of data packets via a first interface, checks the data stream with respect to filtering rules and outputs the data to a second interface. The device includes an outputting unit configured to duplicate the data stream at the second interface and to output the data to a line, a checking unit configured to check the output data stream for impermissible data traffic, and a communication unit configured to transmit a warning message to the security network gateway unit if impermissible data traffic is detected in the data stream.

[0027] This device may check a security network gateway unit using permanently predefined filtering rules that may be configured only with difficulty (e.g., by checking the data stream output by the network gateway unit using a device equipped with the most recent security rules) and may also detect new methods of attack or impermissible data. Because the device does not have any influence on the data stream at the second interface, the device operates without a reaction (e.g., without intervening in the security-relevant data network to which the data are passed). There is nevertheless a quick reaction with respect to restricting the data stream at the second interface. This may be advantageous if the actual security network gateway unit cannot be updated, or the gateway unit may only be updated to a limited extent (e.g., filtering rules may be updated or patched, such as owing to required certification or authorization that may be repeated during an update). In contrast, the device (e.g., the monitoring device discussed below) may be flexibly updated because the device does not have any reaction with respect to the permissible communication. As long as the "active" security network gateway unit is sufficiently good in this case, a security network gateway unit that has not been updated may remain in operation. However, as soon as the occurrence of impermissible data traffic is observed, the connectivity is externally restricted.

[0028] In one embodiment, the device includes an additional outputting unit configured to duplicate and output the data stream at the first interface, and a comparison unit configured to compare the output data stream from the first interface with the data stream from the second interface and to cause the communication unit to transmit a warning message to the security network gateway unit if differences between the data stream from the second interface and the data stream from the first interface are detected.

[0029] As a result, it is detected whether the network gateway unit successfully averts impermissible data traffic and if the network gateway unit is operating incorrectly (e.g., changed by manipulation) and outputs additional data packets that have not been received via the first interface to the second interface.

[0030] The system for monitoring a security network gateway unit includes a security network gateway unit configured

to receive a stream of data packets via a first interface, to check this data with respect to filtering rules, and to output the data sets to a second interface.

[0031] The system also includes a monitoring unit having an outputting unit configured to duplicate and output the data stream at the second interface, a checking unit for checking the output data stream for impermissible data traffic, and a communication unit configured to transmit a warning message to the security network gateway unit if impermissible data traffic is detected in the data stream (e.g., upon which the security network gateway unit is set up to restrict the data stream).

[0032] In one embodiment, the warning message may be provided as an electrical switching signal.

[0033] In one embodiment of the system, the monitoring unit also includes an outputting unit configured to duplicate and output the data stream at the first interface, and a comparison unit configured to compare the output data stream from the first interface with the data stream from the second interface and to cause the communication unit to transmit a warning message to the security network gateway unit if differences between the data stream from the second interface and the data stream from the first interface are detected.

[0034] A computer program having program instructions for carrying out the method and a data storage medium (e.g., a non-transitory computer-readable storage medium) that stores the computer program are also provided.

[0035] Exemplary embodiments of the method according to the invention, the device according to the invention and the system according to the invention are illustrated by way of example in the drawings and are explained in more detail using the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] FIG. **1***a* depicts an embodiment of a method in a flowchart.

[0037] FIG. **1***b* depicts another embodiment of the method in a flowchart.

[0038] FIG. **1***c* depicts another embodiment of the method in a flowchart.

[0039] FIG. **2** depicts a schematic illustration of an embodiment of a system with output of a data stream only at a second interface.

[0040] FIG. **3** depicts a schematic illustration of another embodiment of a system with output of the data stream at a first interface and a second interface.

[0041] Parts that correspond to one another are provided with the same reference symbols in all figures. The security network gateway unit is also referred to only as network gateway unit below.

DETAILED DESCRIPTION

[0042] FIG. **1***a* depicts one embodiment of a method for monitoring correct function of a network gateway unit with the absence of a reaction. In this embodiment, the absence of a reaction indicates that the data network to which the data traffic is passed is not influenced by the network gateway unit. For example, no additional data packets are generated and output to such a security-relevant automation network (e.g., by the network gateway unit).

[0043] In state **10** of the method, the security network gateway unit receives a data stream from a first data network at a first interface and, after checking, outputs the data stream to a second interface in a second data network (e.g., a security-relevant automation network).

[0044] In act **11**, the data stream is duplicated at the second interface (e.g., within the second data network), and is output (e.g., to a separate line). In this case, the data stream is to be output within the security-relevant network and upstream of components that change the data stream. In act **12**, the output data stream is checked for impermissible data traffic. For example, the check **12** may take place by filtering rules corresponding to the active filtering rules of the network gateway unit. However, the output data stream may be checked by extended filtering rules (e.g., filtering rules updated with the most recent antivirus patches). In this case, an IP address of the data packets and/or the port numbers in the data packet or the useful data contents in the data packet may be checked, or the data stream may be examined for specific attack patterns over a plurality of data packets.

[0045] The checking **12** takes place in a manner completely decoupled from the checking of the data stream in the network gateway unit. The data stream at the second interface is neither delayed in terms of time nor changed in terms of content. The checking **12** of the output data stream therefore remains completely invisible and therefore has no reaction for the network receiving the data stream. If the data stream is identified as permissible data traffic, the data packets are output to the second interface and the method is terminated in act **13**.

[0046] If impermissible data traffic is detected in the data stream, a warning message is transmitted to the network gateway unit in act **14**. If the network gateway unit receives the warning message, the network gateway unit initiates restriction of the data stream in act **15**. The method may be terminated in act **13**.

[0047] In one variant of the method illustrated in FIG. **1***b*, a check is additionally carried out for a data packet from the second interface that has not already been identified as permissible in act **12** based on the data stream received at the first interface. A data stream duplicated and output at the first interface of the network gateway unit is recorded for this purpose in act **16**. In act **17**, the output data stream from the first interface is used to check the data packet further.

[0048] A status message (e.g., an overload message or a maintenance mode message) may be emitted by the network gateway unit at the second interface, for example, which is permissible in this example only when particular data packets have been received at the first interface of the network gateway. For example, it is possible to check whether there is a denial-of-service attack pattern at the first interface of the network gateway unit or whether maintenance access (e.g., remote service access) to the network gateway unit takes place via the first interface of the network gateway unit (e.g., via an HTTPS or SSH connection).

[0049] If the data stream is identified as permissible data traffic during the check in act **17**, the data packets are output to the second interface and the method is terminated in act **13**. If the packet from the second interface is identified as impermissible, a warning message is transmitted to the network gateway unit in act **14**, whereupon the network gateway unit causes the data stream to be restricted (e.g., act **15**).

[0050] In another embodiment of the method, the data stream entering the security network gateway unit is duplicated and output at the first interface, and the output data stream from the first interface is then compared with the

output data stream from the second interface. This check may be carried out in parallel with the checks illustrated in FIG. **1***a* or FIG. **1***b*.

[0051] In the variant illustrated in FIG. **1***c*, this additional check **18** is carried out if the data stream is identified as permissible data traffic in act **12**. For this purpose, a data stream duplicated and output at the first interface of the network gateway unit is recorded in act **16**. In act **18**, the output data stream from the first interface is used to check the data packet further. For the data packet received at the second interface, a check is carried out to determine whether an identical packet was present in the data stream from the first interface or was present in the data stream from the first interface (e.g., former time window). If an identical packet was present, this check is terminated in act **13**. If, however, an inconsistency in the two data streams is determined, a warning message is transmitted to the network gateway unit in act **14'**, whereupon the network gateway unit causes the data stream to be restricted in act **15**.

[0052] This additional check illustrated in FIG. **1***c* may also be added to the variant illustrated in FIG. **1***b*.

[0053] Comparing the incoming data stream with the outgoing data stream makes it possible to detect that filtering by the network gateway unit has taken place (e.g., if impermissible incoming data packets are not contained in the outgoing data stream). In contrast, if data packets that did not arrive at the first interface in the network gateway unit are detected in the outgoing data stream at the second interface, an error in the network gateway unit may be inferred. For example, it is possible to detect if the network gateway unit does not block a data packet or forward the data packet without change, but rather, emits a modified data packet or an additional data packet. In this case, it is therefore possible to detect if the network gateway unit emits a data packet that the network gateway unit has not previously actually received.

[0054] The warning message causes the network gateway unit to change to a restrictive filtering mode (e.g., by activating replacement filtering rules). In one variant, the warning message may cause the network gateway unit to restart, which may be carried out with an unchanged, supported software version or boot image, resulting in a permanently stored permissible default configuration or recovery configuration that is activated again. If the network gateway unit is in the form of an embedded system, the main memory is reset to an initial state during a restart. A defective or manipulated software version may be deactivated.

[0055] Alternatively, the network gateway device may be restarted with a replacement firmware image. For example, two file system partitions with different implementations of the network gateway unit may be provided. If a warning message is received in the network gateway device, a restart is carried out (e.g., the file system partition with the restrictive implementation is started).

[0056] If the network gateway unit is implemented in the form of a virtual machine with a hypervisor or microvisor, a plurality of logical partitions are present separately as virtual machines or partitions. Data packet filtering is carried out in this case in a virtual machine. If the warning message is applied, a first virtual machine is deactivated and a replacement virtual machine with restrictive filtering regulations and/or an alternative filter implementation is activated. Such a change is possible in less than one second (e.g., in the range of milliseconds), allowing virtually uninterrupted operation of the network gateway device.

[0057] In one variant, the monitoring unit is in the form of a separate physical component. In another variant, the monitoring unit is in the form of a virtual machine that is executed by the same hypervisor or microvisor as the network gateway unit.

[0058] Further, if the warning message is applied or received, one or both interfaces may be deactivated. The second interface may be deactivated, with the result that no data packets are output to the second interface. It may be advantageous to deactivate the first interface in order to avoid overflowing of the memories in the network gateway unit. Deactivating the first interface may terminate the data traffic to the security-relevant data network.

[0059] A universally usable variant for restricting the data traffic is to deactivate the power supply of the network gateway unit (e.g., to switch the network gateway unit off). This is possible with very little effort (e.g., by a switchable power supply unit of the network gateway unit) without changing the configuration or implementation of the network gateway unit itself. Network gateway units that do not support any explicit restriction mechanisms may also be monitored by this method, and the data traffic may be restricted.

[0060] In one embodiment of the method, the restrictive, limiting mode of the network gateway unit remains activated as long as the warning message is applied to the network gateway unit. However, the restrictive mode may remain active until an explicit change to a normal mode is made by an administrative action. For example, the normal mode may be triggered by pressing a physical pushbutton or by actuating a key switch, or by an input via a logical administration interface by administration personnel. In this case, the normal mode may also include a new updated filtering rule. The method then changes to the final state denoted by stop.

[0061] FIG. **2** illustrates a system including a network gateway unit **23** and a monitoring unit **24**. For example, the network gateway unit **23** separates two data networks with different security classifications. In this case, a data stream from a network with a low security requirement, such as an office network, is connected to the network gateway unit **23** via a first interface **21**. The network gateway unit **23** checks the data packets or the stream of data packets, and outputs the stream via a second interface **22** (e.g., to a second network that has higher security requirements).

[0062] In the embodiment illustrated in FIG. **2**, only the outgoing data stream at the second interface is duplicated and output to a separate line by an outputting unit **25**. The output data stream is forwarded to the checking unit **26** of the monitoring unit **24** and is checked for impermissible data traffic there. In this case, the address fields in the header of the data packet, for example, may be checked for impermissible origin or destination addresses, or the port number may be compared with permissible port numbers. If the useful contents of the data packet are present in unencrypted form (e.g., in plain text), the contents of the packets may also be checked for suspicious or impermissible patterns, and the data packet may be prevented from being forwarded even before the checking of the data packet is concluded.

[0063] The checking unit **26** is connected to a communication unit **27**. If impermissible data traffic is detected in the checking unit **26**, the checking unit **26** reports this to the communication unit **27**, which transmits or applies a warning message **28** to the network gateway unit **23**. For example, the warning message may be provided as an electrical switching signal.

[0064] FIG. **3** depicts a variant of the system in FIG. **2**, in which, in addition to the outgoing data traffic at the second interface **22**, the incoming data stream at the first interface **21** is also duplicated and output to a line to the monitoring unit **24** by an additional outputting unit **31**. The outputting units **25** and **31** may be situated directly at the network gateway unit **23**, resulting in that no further components that could change the data stream are contained in the network gateway unit **23**.

[0065] The data stream output from the first interface **21** is compared with the data stream from the second interface **22** in the comparison unit **32**. For example, the data stream from the second interface **22** may be forwarded to the comparison unit **32** via the checking unit **26**. The comparison unit **32** is connected to the communication unit **27**. If a difference is detected between the data stream from the first interface **21** and the data stream from the second interface **22**, the communication unit **27** transmits a warning message **28** to the network gateway unit **23**. The connection between the monitoring unit **24** and the network gateway unit **23** may be in the form of a wired connection or else a wireless connection or a logical connection.

[0066] All of the described and/or depicted features may be combined with one another within the scope of this disclosure. The monitoring unit may be in the form of a separate component or may be integrated with the network gateway unit.

[0067] The elements and features recited in the appended claims may be combined in different ways to produce new claims that likewise fall within the scope of the present invention. Thus, whereas the dependent claims appended below depend from only a single independent or dependent claim, it is to be understood that these dependent claims may, alternatively, be made to depend in the alternative from any preceding or following claim, whether independent or dependent. Such new combinations are to be understood as forming a part of the present specification.

[0068] While the present invention has been described above by reference to various embodiments, it should be understood that many changes and modifications can be made to the described embodiments. It is therefore intended that the foregoing description be regarded as illustrative rather than limiting, and that it be understood that all equivalents and/or combinations of embodiments are intended to be included in this description.

1. A method for monitoring a security network gateway unit that receives a stream of data packets via a first interface, checks the data stream with respect to filtering rules, and outputs the data stream to a second interface the method comprising:

duplicating and outputting the data stream at the second interface;

checking the output data stream for impermissible data traffic;

transmitting a warning message to the security network gateway unit when impermissible data traffic is detected in the data stream; and

restricting the data stream by the security network gateway unit the warning message is received in the security network gateway unit.

2. The method of claim **1**, further comprising:

duplicating and outputting the data stream at the first interface;

comparing the data stream at the first interface with the data stream at the second interface; and

transmitting a warning message to the security network gateway unit when the data stream from the second interface differs from the data stream from the first interface.

3. The method of claim **1**, wherein restricting the data stream comprises activating replacement filtering rules of the security network gateway unit.

4. The method of claim **1**, wherein restricting the data stream comprises restarting the security network gateway unit with protected boot software restarting the security network gateway unit with a replacement firmware image, or changing from an active virtual machine to a replacement virtual machine in a security network gateway unit.

5. The method of claim **1**, wherein restricting the data stream comprises deactivating the second interface deactivating the first interface of the security network gateway unit, or a combination thereof.

6. The method of claim **1**, wherein restricting the data stream comprises deactivating a power supply unit of the network gateway unit.

7. The method of claim **1**, wherein the restriction remains active in the security network gateway unit as long as the warning message is received at the security network gateway unit.

8. The method of claim **1**, wherein the restriction of the security network gateway unit remains active until an explicit signal for canceling the restriction is received at the security network gateway unit.

9. A device for monitoring a security network gateway unit that receives a stream of data packets via a first interface, checks this data stream with respect to filtering rules and outputs it to a second interface, the device comprising:

an output unit configured to duplicate and output the data stream at the second interface;

a processor configured to check the output data stream for impermissible data traffic; and

a communication unit configured to transmit a warning message to the security network gateway when impermissible data traffic is detected in the data stream.

10. The device of claim **9**, wherein the output unit is a first output unit, and

wherein the device further comprises:

a second output unit configured to duplicate and output the data stream at the first interface, and

a comparator configured to compare the output data stream from the first interface with the data stream from the second interface and to cause the communication unit to transmit a warning message to the security network gateway unit when differences between the data stream from the second interface and the data stream from the first interface are detected.

11. The device of claim **9**, wherein the security network gateway unit is configured restrict the data stream when the warning message is received in the security network gateway unit.

12. A system for monitoring a security network gateway unit, the system comprising:

a security network gateway unit configured to:

receive a stream of data packets via a first interface;

check the stream of data packets with respect to filtering rules; and

output the stream of data packets to a second interface; and

a monitoring unit comprising:

an output unit configured to duplicate and output the stream of data packets at the second interface:

a processor configured to check the output data stream for impermissible data traffic; and

a communication unit configured to transmit a warning message to the security network gateway unit when impermissible data traffic is detected in the stream of data,

wherein the security network gateway unit is configured to restrict the stream of data packets.

13. The system of claim **12**, wherein the content unit is a first output unit, and

wherein the monitoring unit further comprises:

a second output unit configured to duplicate and output the stream of data packets at the first interface; and

a comparison unit configured to:

compare the output data stream from the first interface with the stream of data packets from the second interface;

cause the communication unit to transmit a warning message to the security network gateway unit when differences between the stream of data packets from the second interface and the stream of data packets from the first interface are detected.

14. The system of claim **13**, wherein the restriction of the stream of data packets comprises activation of replacement filtering rules of the security network gateway unit.

15. A non-transitory computer-readable storage medium storing instructions executable by a processor to monitor a security network gateway unit that receives a stream of data packets via a first interface, checks the data stream with respect to filtering rules, and outputs the data stream to a second interface, the instructions comprising:

duplicating and outputting the data stream at the second interface;

checking the output data stream for impermissible data traffic;

transmitting a warning message to the security network gateway unit when impermissible data traffic is detected in the data stream; and

restricting the data stream by the security network gateway unit when the warning message is received in the security network gateway unit.

16. (canceled)

17. The method of claim **8**, wherein the explicit signal for canceling the restriction is the result of an action by administration personnel.

* * * * *

Electronic Acknowledgement Receipt

EFS ID:	32334801
Application Number:	15614956
International Application Number:	
Confirmation Number:	9334
Title of Invention:	FILTERING NETWORK DATA TRANSFERS
First Named Inventor/Applicant Name:	Sean Moore
Customer Number:	22907
Filer:	Joshua Daniel Schneider/Jennifer Brady
Filer Authorized By:	Joshua Daniel Schneider
Attorney Docket Number:	007742.00091\US
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Application Type:	Utility under 35 USC 111(a)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	Information_Disclosure_Statement_Fillable_PDF3_19079452.pdf	1034823 b25b99289943cd37b74b110825c5fd9d7004bdb3	no	4

Warnings:

Information:					
2	Non Patent Literature	NPL_Memo_ISO_Motion_to_Dismiss_18946680.pdf	245678 3b2ddae708b9eef2af9c7b010f8fdc901db084c1	no	29
Warnings:					
Information:					
3	Non Patent Literature	NPL_Request_for_Judicial_Notice_ISO_Motion_to_Dismiss_18946700.pdf	1986895 67af8e66a9bc84e9a219a702091db37efdb31ad7	no	38
Warnings:					
Information:					
4	Non Patent Literature	NPL_Complaint_CaseNo2_17_cv_00383_18947106.pdf	777290 18bc1be3bc1705adb149d58ab64cb0e220aa66a5	no	38
Warnings:					
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5	Non Patent Literature	NPL_Answer_CaseNo2_17_cv_00383_18947110.pdf	163667 ab088423ab6ac53a1e1cc6008d8536f7b1b5191c	no	14
Warnings:					
Information:					
6	Non Patent Literature	Non-Final_Rejection__1449_19021405.pdf	1133118 e1e3e01f177b75d15483cecaff7257ebe9930264	no	40
Warnings:					
Information:					
7	Non Patent Literature	81546EP1_EPO_Rule_164_16_March_2018_19048976.PDF	208604 ef454909c62877c750cd1d7a7cd007402d9bc1f4	no	7
Warnings:					
Information:					
8	Non Patent Literature	76111EP1_EPO_Examination_Report_15_March_2018_19048764.PDF	274333 f88bb895ae01393dae9526578ed75332de1df449	no	7
Warnings:					
Information:					

9	Non Patent Literature	AU_Examination_Report_dated_21_March_2018_19051674.PDF	199907 340ee457515a6c7c76a505152a0f6249d5456acb	no	4

Warnings:	
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Total Files Size (in bytes):	6024315

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/614,956

APPLICATION AS FILED - PART I

	(Column 1)	(Column 2)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE($)	FEE($)		RATE($)	FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 230 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	785		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/614,956	06/06/2017		800	007742.00091\US	20	3

CONFIRMATION NO. 9334

UPDATED FILING RECEIPT

22907
BANNER & WITCOFF, LTD.
1100 13th STREET, N.W.
SUITE 1200
WASHINGTON, DC 20005-4051

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Date Mailed: 01/22/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

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Applicant(s)

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Power of Attorney: The patent practitioners associated with Customer Number 22907

Domestic Priority data as claimed by applicant

This application is a CON of 14/625,486 02/18/2015 PAT 9686193
which is a CON of 13/795,822 03/12/2013 PAT 9124552

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 06/13/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/614,956**

Projected Publication Date: 05/03/2018

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

FILTERING NETWORK DATA TRANSFERS

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).