computing, based at least partially upon the set of behavioral statistics, a badness factor

for the flow, wherein the badness factor provides an indication of whether the flow is

exhibiting undesirable behavior.

6. (Original)   The method of claim 5, wherein the badness factor also provides an indication of

a degree to which the flow is behaving undesirably.

7. (Original)   The method of claim 6, further comprising:

determining, based at least partially upon the badness factor, a penalty to impose on the

flow.

8. (Original)   The method of claim 7, further comprising: enforcing the penalty on the flow.

9. (Original)   The method of claim 8, wherein enforcing the penalty on the flow causes the flow

to exhibit less undesirable behavior, thereby, causing the badness factor of the flow to improve.

10. (Original) The method of claim 8, wherein the penalty is enforced on the flow when a

congestion condition is encountered.

11. (Original) The method of claim 8, wherein no penalty is enforced on the flow unless a

congestion condition is encountered, regardless of how undesirably the flow is behaving.

12. (Original) The method of claim 8, wherein the penalty is determined and enforced on the

flow even when no congestion condition is encountered.

13. (Original) The method of claim 8, wherein determining the penalty comprises:

determining an increased drop rate to impose on one or more information packets

belonging to the flow.

14. (Original) The method of claim 13, wherein enforcing the penalty comprises:

imposing the increased drop rate on the flow such that the information packets belonging

to the flow have a higher probability of being dropped than information packets

belonging to other flows that do not exhibit undesirable behavior.

15. (Original) The method of claim 5, wherein the set of behavioral statistics comprises a

measure T of how much total information has been contained in all of the information packets

belonging to the flow that have been forwarded up to a current point in time.

16. (Original) The method of claim 5, wherein the set of behavioral statistics comprises a

measure L of how long the flow has been in existence up to a current point in time.

17. (Original) The method of claim 16, wherein the set of behavioral statistics comprises a rate

R of information transfer for the flow, wherein R is derived by dividing T by L.

18. (Original) The method of claim 5, wherein the set of behavioral statistics comprises an

average size for the information packets belonging to the flow.

19. (Original) The method of claim 5, wherein maintaining the set of behavioral statistics

comprises:

receiving a particular information packet belonging to the flow;

determining whether to forward the particular information packet to a destination; and

in response to a determination to forward the particular information packet to the

destination, updating the set of behavioral statistics to reflect processing of the particular

information packet.

20. (Original) The method of claim 5, wherein maintaining the set of behavioral statistics

comprises:

receiving a particular information packet belonging to the flow; and

updating the set of behavioral statistics to reflect processing of the particular information packet, regardless of whether the particular information packet is discarded or forwarded to a destination.

21. (Original) A misbehaving flow manager (MFM) for processing a flow, the flow comprising a series of information packets, the MFM comprising:

means for maintaining a set of behavioral statistics for the flow, wherein the set of behavioral statistics are updated as information packets belonging to the flow are processed;

means for determining, based at least partially upon the set of behavioral statistics, whether the flow is exhibiting undesirable behavior; and

means for enforcing, in response to a determination that the flow is exhibiting undesirable behavior, a penalty on the flow.

22. (Original) The MFM of claim 21, wherein enforcing the penalty has an effect of correcting the flow's behavior such that the flow exhibits less undesirable behavior.

23. (Original) The MFM of claim 21, wherein the means for enforcing the penalty comprises:

means for imposing an increased drop rate on the flow such that the information packets belonging to the flow have a higher probability of being dropped than information packets belonging to other flows that do not exhibit undesirable behavior.

24. (Original) The MFM of claim 21, wherein the penalty is enforced when a congestion condition is encountered.

25. (Original) A misbehaving flow manager (MFM) for processing a flow, the flow comprising a series of information packets, the MFM comprising:

Response to Final Office Action

means for maintaining a set of behavioral statistics for the flow, wherein the set of

behavioral statistics are updated as information packets belonging to the flow are

processed; and

means for computing, based at least partially upon the set of behavioral statistics, a

badness factor for the flow, wherein the badness factor provides an indication of whether

the flow is exhibiting undesirable behavior.

26. (Original) The MFM of claim 25, wherein the badness factor also provides an indication of a

degree to which the flow is behaving undesirably.

27. (Original) The MFM of claim 26, further comprising:

means for determining, based at least partially upon the badness factor, a penalty to

impose on the flow.

28. (Original) The MFM of claim 27, further comprising: means for enforcing the penalty on the

flow.

29. (Original) The MFM of claim 28, wherein enforcing the penalty on the flow causes the flow

to exhibit less undesirable behavior, thereby, causing the badness factor of the flow to improve.

30. (Original) The MFM of claim 28, wherein the penalty is enforced on the flow when a

congestion condition is encountered.

31. (Original) The MFM of claim 28, wherein no penalty is enforced on the flow unless a

congestion condition is encountered, regardless of how undesirably the flow is behaving.

32. (Original) The MFM of claim 28, wherein the penalty is determined and enforced on the

flow even when no congestion condition is encountered.

33. (Original) The MFM of claim 28, wherein the means for determining the penalty comprises:

means for determining an increased drop rate to impose on one or more information packets belonging to the flow.

34. (Original) The MFM of claim 33, wherein the means for enforcing the penalty comprises:

means for imposing the increased drop rate on the flow such that the information packets belonging to the flow have a higher probability of being dropped than information packets belonging to other flows that do not exhibit undesirable behavior.

35. (Original) The MFM of claim 25, wherein the set of behavioral statistics comprises a measure T of how much total information has been contained in all of the information packets belonging to the flow that have been forwarded up to a current point in time.

36. (Original) The MFM of claim 25, wherein the set of behavioral statistics comprises a measure L of how long the flow has been in existence up to a current point in time.

37. (Original) The MFM of claim 36, wherein the set of behavioral statistics comprises a rate R of information transfer for the flow, wherein R is derived by dividing T by L.

38. (Original) The MFM of claim 25, wherein the set of behavioral statistics comprises an average size for the information packets belonging to the flow.

39. (Original) The MFM of claim 25, wherein the means for maintaining the set of behavioral statistics comprises:

means for receiving a particular information packet belonging to the flow;

means for determining whether to forward the particular information packet to a destination; and

means for updating, in response to a determination to forward the particular information packet to the destination, the set of behavioral statistics to reflect processing of the particular information packet.

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40. (Original) The MFM of claim 25, wherein the means for maintaining the set of behavioral statistics comprises:

means for receiving a particular information packet belonging to the flow; and

means for updating the set of behavioral statistics to reflect processing of the particular information packet, regardless of whether the particular information packet is discarded or forwarded to a destination.

41. (New)   A machine-implemented method for processing a single flow, the flow comprising a plurality of packets, and the method comprising:

creating a flow block as the first packet of a flow is processed by a single router;

said flow block being configured to store payload-content-agnostic behavioral statistics pertaining to said flow;

said router updating said flow block with the payload-content-agnostic behavioral statistics as packets belonging to said flow are processed by said router;

said router heuristically determining whether said flow exhibits undesirable behavior by comparing at least one of said payload-content-agnostic behavioral statistics to at least one pre-determined threshold value; and

upon determination by said router that said flow exhibits undesirable behavior, enforcing, relative to at least one packet, a penalty;

wherein said payload-content-agnostic behavioral statistics for said flow are calculated by said router without requiring use of inter-router data.

42. (New)   A computer-readable medium having computer-executable instructions for performing a method to process a single flow, the flow comprising a plurality of packets, and the method comprising:

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creating a flow block as the first packet of a flow is processed by a single router;

said flow block being configured to store payload-content agnostic behavioral statistics about said flow;

said router updating said flow block with the flow's behavioral statistics as packets belonging to said flow are processed by said router;

said router heuristically determining whether said flow is exhibiting undesirable behavior by comparing at least one of said behavioral statistics to at least one pre-determined threshold value; and

upon determination by said router that said flow is exhibiting undesirable behavior, enforcing, relative to at least one packet belonging to said flow, a penalty;

wherein said behavioral statistics for said flow are calculated by said router and independent of inter-router data.

43. (New)   An article of manufacture comprising:

a computer-readable medium having stored thereon a data structure;

a first field containing data representing a flow block;

a second field containing data representing payload-content-agnostic behavioral statistics about a flow;

a third field containing data representing pre-determined behavior threshold values;

a fourth field containing data representing the results of a heuristic determination of whether said flow exhibits undesirable behavior determined by comparing said behavioral statistics to said pre-determined threshold values;

a fifth field containing data representing at least one penalty to be enforced against at least one packet upon determination that said flow exhibits undesirable behavior.

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PATENT APPLICATION FEE DETERMINATION RECORD
Substitute for Form PTO-875

Application or Docket Number	Filing Date	
11/022,599	12/22/2004	☐ To be Mailed

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			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 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			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
04/13/2010		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 43	Minus	** 40	= 3	X $ =		OR	X $52=	156
	Independent (37 CFR 1.16(h))	* 7	Minus	***4	= 3	X $ =		OR	X $220=	660
	☐ Application Size Fee (37 CFR 1.16(s))							OR		
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	**816**

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	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))							OR		
	☐ 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 number found in the appropriate box in column 1.

Legal Instrument Examiner:
/BRENDA WEBB/

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/022,599	12/22/2004	Vishnu Natchu	SABLE-01008	8956

43490   7590   08/19/2010
WEST & ASSOCIATES, A PC
1255 Treat Blvd.
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WALNUT CREEK, CA 94597

EXAMINER
WONG, XAVIER S

ART UNIT	PAPER NUMBER
2462	

NOTIFICATION DATE	DELIVERY MODE
08/19/2010	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):

PATENT@WEST-ASSOCIATES.NET
SJWEST@ASTOUND.NET
PATENT@WESTPATENTLAW.COM

<table>
<tr>
<td rowspan="2">Office Action Summary</td>
<td>Application No.
11/022,599</td>
<td colspan="2">Applicant(s)
NATCHU, VISHNU</td>
</tr>
<tr>
<td>Examiner
Xavier Szewai Wong</td>
<td>Art Unit
2462</td>
<td></td>
</tr>
</table>

-- 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 <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 <u>13th April 2010</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ 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

4)☒ Claim(s) <u>1-43</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-43</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ 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).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).
    a)☐ All   b)☐ Some * c)☐ None of:
      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)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13th April 2010 has been entered.

Response to Arguments

Arguments filed on 13th April 2010 have been considered but are moot in view of *new grounds* of rejections. **Jacobson** et al teaches a method for processing <u>one flow</u> at a time based on information from <u>only that one flow</u> (remarks pg. 12); see rejection below.

Nonetheless, the examiner maintains disagreement that **Zikan** et al cannot be modified to teach "one flow" processing since **Zikan** et al *clearly* states "an overall flow in a particular arc typically is a [conglomeration] of **one** [*or* more separate] **flow**(s)," in other words, the arc flow ***can be*** <u>one single flow</u> (emphasis added). Such (each one / single) arc flow is governed by a penalty and merit function $E_{\alpha,\beta}(f)$ as explained in col. 10 lines 29-30.

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 **42** and **43** are directed to non-statutory subject matter. The "computer-readable medium" may be "an optical medium (e.g. an optical fiber), a coaxial <u>cable</u>, or <u>some other type</u> of medium. For purposes of the present invention, network 100 may use <u>any type</u> of transport medium," which may comprise of both *transitory* and *non-transitory* medium as indicated on page 6 paragraph 0017 of the applicant's specification. It **must** be made clear that the invention is claiming a -- Non-Transitory -- computer-readable medium in order for the claims to be statutory.

Claim Rejections - 35 USC § 102

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 –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims **1**, **2, 4 – 8**, **10**, **21**, **22**, **24**, **25**, **27 – 30**, **41** and **42** are rejected under 35 U.S.C. 102(e) as being anticipated by **Jacobson** et al (**US 2005/0226149 A1**).

Consider claims **1** and **21**, **Jacobson** et al teach a dynamic load balancer (e.g. MFM) for processing a flow which comprises of a series of information packets (fig. 1: gateway 106; *abstract*: to identify <u>a</u> non-adaptive flow; [0009] lines 13-15: <u>per-flow</u> basis), the balancer comprising means for: maintaining a set of behavioral statistics, which are updated as information packets belong to the flow are processed, for the flow

([0098]: changing parameters… statistical method for a flow); determining, based upon

the behavioral statistics, whether the flow is exhibiting undesirable behavior ([0086]:

detect non-adaptive flow); enforcing, in response to the determination of undesirable

behavior, a penalty on the flow ([0101-0102]: penalty for a flow).

Consider claims **5** and **25**, **Jacobson** et al disclose a dynamic load balancer (e.g.

MFM) for processing a flow which comprises of a series of information packets (fig. 1:

gateway 106; *abstract*: to identify a non-adaptive flow; [0009] lines 13-15: per-flow

basis; [0056]: a series of packets), the balancer comprising means for: maintaining a set

of behavioral statistics, which are updated as information packets belong to the flow are

processed, for the flow ([0098]: changing parameters… statistical method for a flow);

computing, based at least partially upon the set of behavioral statistics, a badness factor

for the flow ([0097]: DEM for a flow), to provide indication of whether the flow is

exhibiting undesirable behavior ([0101-0103]: penalty for a flow).

Consider claims **2** and **22**, as applied to claims **1** and **21**, **Jacobson** et al teach

means for the penalty has an effect of correcting the flow's behavior such that the flow

exhibits less undesirable behavior ([0101]: reduce sending rate for non-adaptive flow).

Consider claims **4**, **10**, **24** and **30**, as applied to claims **1**, **8**, **21** and **28**,

Jacobson et al teach that the invention is to solve, among other misbehaviors/faults,

congestion in a network ([0098]: congestion); the penalty function is enforced when a

misbehavior/fault, such as a congestion, is encountered ([0100-0103]: penalty).

Consider claims **6** and **26**, as applied to claims **5** and **25**, **Jacobson** et al teach the badness factor providing an indication of a degree to which the flow is behaving undesirably ([0097]: DEM for a flow).

Consider claims **7**, **8**, **27** and **28** as applied to claims **6**, **7**, **26** and **27**, **Jacobson** et al teach means for determining, based on the badness factor, a penalty to impose and enforce on the flow ([0098] lines 15-24).

Consider claims **41** and **42**, **Jacobson** et al teach a machine-implemented method for processing a single flow by a computer readable medium having computer-executable instructions (fig. 1: gateway 106; *abstract*: to identify a non-adaptive flow; [0009] lines 13-15: per-flow basis), the flow comprising a plurality of packets ([0056]: a series of packets) and the method comprising:

creating a flow block as the first packet of a flow is processed by a single router (fig. 9: flow block 904 in gateway 106);

said flow block being configured to store payload-content-agnostic behavioral statistics pertaining to said flow ([0095-0097]);

said router updating said flow block with the payload-content-agnostic behavioral statistics as packets belonging to said flow are processed by the router ([0098]: changing parameters… statistical method for a flow);

said router heuristically determining whether said flow exhibits undesirable behavior by comparing at least one of said payload-content-agnostic behavioral statistics to at least one pre-determined threshold value (fig. 2: lower and upper thresholds; [0098] + claims 4 and 5: comparing DEM of a flow to a range); and

upon determination by said router that said flow exhibits undesirable behavior,

enforcing, relative to at least one packet, a penalty ([0101-0103]: penalty);

wherein said payload-content-agnostic behavioral statistics for said flow are

calculated by said router without (independent of) use of inter-router data (fig. 1: only

gateway 106 is used, so there is not other "inter-router" data for gateway 106 to depend

on).

Claim Rejections - 35 USC § 103

The following is a quotation of 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 of this title, 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.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims **3**, **12**, **13**, **14**, **18**, **23**, **32**, **33**, **34** and **38** are rejected under 35 U.S.C.

103(a) as being unpatentable over **Jacobson** et al (**US 2005/0226149 A1**) in view of

Skirmont (**US 6,252,848 B1**).

Consider claims **3**, **13**, **14**, **23**, **33** and **34**, as applied to claims **1**, **8**, **13**, **21**, **28** and **33**, **Jacobson** et al teach the penalty imposed involve lost packets (Zikan, col. *4* ln. *16*-20: drop rate). However, **Jacobson** et al may not have *explicitly* mentioned an <u>increased</u> drop rate such that a misbehaving flow has a <u>higher probability</u> of being dropped than flows that do not exhibit undesirable misbehavior. **Skirmont** teaches means for assigning not well-behaved flows to higher drop probabilities and therefore, creating an increased drop rate, than a flow that is well-behaved (col. *4* ln. *64-67*). It would have been obvious to one of ordinary skill in the art at the time the invention was created to apply the teachings of **Skirmont** to the penalty function of **Jacobson** et al for penalty enforcement on misbehaving flows.

Consider claims **12** and **32**, as applied to claims **8** and **28**, **Jacobson** et al teach the claimed invention except may not have *explicitly* mentioned the penalty is determined and enforced on the flow even when <u>no congestion</u> condition is encountered. **Skirmont** mentions a Random Early Detection (RED) algorithm comprising means for allowing the dropping of packets *without regard* to the characteristics (e.g. congestion) of a flow (col. *5* ln. *21-24*). It would have been obvious to one of ordinary skill in the art at the time the invention was created to incorporate the RED algorithm as mentioned by **Skirmont** to the load balancer of **Jacobson** et al for improving network flow performance.

Consider claims **18** and **38**, as applied to claims **5** and **25**, **Jacobson** et al teach the claimed invention except may not have *explicitly* mentioned the behavioral statistics comprising an average size for the information packets of a flow. **Skirmont** teaches in

figure *2* an average queue (flow) size is taken into account when deciding a drop

probability (col. *4* ln. *26-34*). It would have been obvious to one of ordinary skill in the art

at the time the invention was created to apply the teachings of **Skirmont** to the penalty

function of **Jacobson** et al for enforcing flow traffic.

Claims **9** and **29** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Jacobson et al (**US 2005/0226149 A1**) in view of **Zikan** et al (**US 6,310,881 B1**).

Consider claims **9** and **29**, as applied to claims **8** and **28**, **Jacobson** et al teach

means for the penalty has an effect (enforcing) of correcting the flow's behavior such that

the flow exhibits less undesirable behavior ([0097-0098]: DEM for a flow). **Jacobson** et

al do not very explicitly teach "causing the badness factor to improve." **Zikan** et al teach

concept of causing $E_{\alpha,\beta}(f)$ (e.g. badness factor) to improve (*maximization* of merit functions:

col. *10* ln. *20-28*). It would have been obvious to one skilled in the art to apply a function

of causing improvement in some badness factor as taught by **Zikan** et al to the single

flow processing means of **Jacobson** et al to dynamically regulate each flow individually.

Claims **11** and **31** are rejected under 35 U.S.C. 103(a) as being unpatentable

over **Jacobson** et al (**US 2005/0226149 A1**) in view of **Afanador** (**US 6,167,041**).

Consider claims **11** and **31**, as applied to claims **8** and **28**, **Jacobson** et al

disclose the claimed invention except may not have *explicitly* mentioned no penalty is

enforced on a flow unless a congestion is encountered, regardless of how undesirably

the flow is behaving. **Afanador** teaches that only offending queues (flows) are penalized

in time of congestion (col. *8* ln. *25-33*). It would have been obvious to one of ordinary skill in the art at the time the invention was created to apply the teachings of **Afanador** to the penalty function of **Jacobson** et al for fair penalization of flows.

Claims **15**, **16**, **17**, **35**, **36** and **37** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Jacobson** et al (**US 2005/0226149 A1**) in view of **Scifres** et al (**US 7,113,990 B2**).

Consider claims **15**, **16**, **17**, **35**, **36** and **37**, as applied to claims **1**, **5**, **16**, **25** and **36**, **Jacobson** et al teach the claimed invention except may not have *explicitly* mentioned the behavioral statistics comprising: T for an amount of total information contained in all of the information packets belonging to a flow, an L for how long the flow has been existing, and using T/L to obtain R, which is a rate for information transfer of the flow. **Scifres** et al teach a flow volume *32* (e.g. T) is divided by a time period *46* (e.g. L) to obtain an average flow rate (e.g. R) (col. *5* ln. *9-13*). It would have been obvious to one of ordinary skill in the art at the time the invention was created to apply the calculation method as taught by **Scifres** et al to the penalty function of **Jacobson** et al for flow restriction and allocation.

Claims **19**, **20**, **39** and **40** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Jacobson** et al (**US 2005/0226149 A1**) in view of **Kejriwal** et al (**US 6,934,250 B1**).

Consider claims **19**, **20**, **39** and **40**, as applied to claims **5** and **25**, **Jacobson** et al disclose the claimed invention except may not have *explicitly* mentioned means for

receiving and determining whether to forward a particular information packet to a

destination; updating, in response to a determination to forward the particular packet, a

set of behavioral statistics to reflect processing of the particular packet; and updating

regardless of whether the particular information packet is discarded or forwarded to a

destination. **Kejriwal** et al teach means for a policing embodiment determines whether

a received packet is to be rejected (discarded) or enqueued (forwarded out of a processor

pipeline) to a destination based on a length indicator (packet conforming or non-conforming

information); as a statistics table *921* is being written based on the information of the

packet, *either* rejected or forwarded. (col. *24* lines *30-43* & *47-65*; fig. *9* @ *917,922,924,950*

→ fig. *5A*). It would have been obvious to one of ordinary skill in the art at the time the

invention was created to apply the functions as taught by **Kejriwal** et al to the penalty

function of **Jacobson** et al for distinguishing good and bad flows individually.

Claim **43** is rejected under 35 U.S.C. 103(a) as being unpatentable over

Jacobson et al (**US 2005/0226149 A1**) in view of **Yazaki** et al (**US 2010/0110889 A1**).

Consider claim **43**, **Jacobson** et al teach an article of manufacture (fig. 1:

gateway 106) comprising:

a computer-readable medium having stored thereon a data structure (figs. 9 and

10 tables);

a first field containing data representing a flow block (fig. 9: column 904 contains

indicia of flow of packet; [0082] lines 10-18); and

a second field containing data representing payload-content-agnostic behavioral

statistics about a flow (fig. 9: column 906 drop times; [0083] – drop times involve

behavior of the packet as shown in [0101]).

While **Jacobson** et al mention:

i.) data representing pre-determined behavior threshold values (fig. 2: lower and

upper thresholds; [0098] + claims 4 and 5: comparing DEM of a flow to a range);

ii.) data representing the results of a heuristic determination of whether said flow

exhibits undesirable behavior determined by comparing said behavioral statistics to said

pre-determined threshold values ([0098]: changing parameters… statistical method for a

flow; [0098] + claims 4 and 5: comparing DEM of a flow to a range); and

iii.) data representing at least one penalty to be enforced against *at least one*

packet upon determination that said flow exhibits undesirable behavior ([0101-0103]:

penalty);

Jacobson et al may not have very explicitly mentioned "a third field," "a fourth

field," and "a fifth field" to indicate on the table of processes i., ii. and iii. respectively.

Yazaki shows fields ([0061]) that indicate i ([0097] lines 1-4: THR – threshold); ii

([0097] lines 1-4: CNT – count of bytes); and iii ([0097] lines 1-4: W – weight; [0061]

lines 13-23: PRIC/PRIN – priority conformance or non-conformance) (see claim 1 also). It

would have been obvious to one skilled in the art to modify the data structure (table) of

Jacobson et al to include fields for i., ii. and iii. as taught by **Yazaki** et al for the purpose

of providing more information to judge whether a flow or packet is conformant or not.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xavier Szewai Wong whose telephone number is 571.270.1780. The examiner can normally be reached on Monday through Friday 10:30 am - 8:00 pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571.272.3174. 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.

/Xavier Szewai Wong/
Patent Examiner AU 2462
15th August 2010

		Application/Control No.	Applicant(s)/Patent Under Reexamination
Notice of References Cited		11/022,599	NATCHU, VISHNU
		Examiner	Art Unit	Page 1 of 1
		Xavier Szewai Wong	2462	

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2005/0226149 A1	10-2005	Jacobson et al.	370/229
*	B	US-2010/0110889 A1	05-2010	Yazaki et al.	370/230
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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.** 11022599	**Applicant(s)/Patent Under Reexamination** NATCHU, VISHNU
	Examiner Xavier Szewai Wong	**Art Unit** 2462

SEARCHED

Class	Subclass	Date	Examiner
370	229-236	10.30.09	XSW
updated	above	08.14.2010	/XSW/

SEARCH NOTES

Search Notes	Date	Examiner
EAST image, class and keyword search in USPAT, US-PGPUB, DERWENT, EPO, JPO, and IBM_TDB (please see search history)	10.30.09	XSW
Inventor Name and Assignee search in PALM and EAST	10.30.09	XSW
updated above	08.14.2010	/XSW/

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2549	(block packet) with (behavi$6 statistic$5 histor $5) with updat$5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:32
L2	29999827	@rlad < "20041222" @ad < "20041222"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:32
L3	18261	L2 and 370/229-254.ccls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:32
L4	169	L1 and L3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:33
L5	95	(block packet) with (behavi$6 statistic$5 histor $5) with updat$5 with (travers$5 pass$5by pass$3)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:34
L6	7	L5 and L3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:34
L7	111998	L2 and "370".clas.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:41
L8	113	(block packet) with (behavi$6 statistic$5 histor $5) with (captur $3 updat$5) with (travers$5 pass $5by pass$3)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:42

L9	20	L8 and L7	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:42
L10	4946	(block packet) with (travers$5 pass$5by pass$3) with (captur$5 updat$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:56
L11	678	L10 and L7	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:57
L12	233	L10 and L3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 15:57
L13	1099	(block packet) with (travers$5 pass$5by pass$3) with (behavio$5 statistic$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 16:45
L14	112	L13 and L3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/05 16:51

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	122	(Natchu near Vishnu).in. SABLE.as.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/14 21:53
L2	1	L1 and (penalty and behavio$1r$5).clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/14 21:53
L3	8357	370/229-236.ccls. and (@rlad < "20041222" @ad < "20041222")	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/14 21:54
L4	7	L3 and (single individual one) adj (flow stream block train) same penal $5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/14 22:06
L5	27	L3 and (single individual one) adj (flow stream block train) same behavio $1r$5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/14 22:13
L6	4	L3 and (single individual one) adj (flow stream block train) and behavio $1r$5 same penal $5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/14 22:45
L7	114544	("370"/$ "455"/ $.709/$).ccls. and (@rlad < "20041222" @ad < "20041222")	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/14 22:56
L8	38	L7 and (single individual one) adj (flow stream block train) and behavio $1r$5 same penal $5	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/14 22:57

| L9 | 2 | L7 and (single individual one) adj (flow stream block train) same penal $5 same (discard $4 drop$4) same (time period) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2010/08/14 23:16 |

EAST Search History (Interference)

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	114544	("370"/$ "455"/$.709/$).ccls. and (@rlad < "20041222" @ad < "20041222")	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/15 20:28
L2	7	L1 and (table list database) same (behavio$1r$4 penalty) same threshold same (flow stream block)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/15 20:29
L3	1	L1 and (table list database) same behavio$1r$4 same penal$5 same (flow stream block)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/15 20:31
L4	32	L1 and (table list database) same penal$5 same (flow stream block)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/15 20:37
L5	159	L1 and (table list database) with threshold with (flow stream)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/15 21:24
L6	22	L1 and (table list database) with (flow stream) with behavior$4	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/15 21:25
L7	45	L1 and (table list database) with (flow stream) with (conform$5 penal$5)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/08/15 21:29

| L8 | 3 | L1 and (table list database) with (flow stream) with (conform$5 penal $5) same (threshold limit) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2010/08/15 21:31 |
| L9 | 45 | L1 and (table list database) with (flow stream) with (conform$5 penal $5) and (bit field) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2010/08/15 21:40 |

EAST Search History (Interference)

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8/15/2010 9:46:55 PM
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wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application
Inventor(s): Natchu, Vishnu
Appln. No.: 11/022,599
Confirm. No.: 8956

PATENT APPLICATION

Art Unit: 2462
Examiner: Wong, Xavier S.

Filed: December 22, 2004
Title: MECHANISM FOR IDENTIFYING AND
PENALIZING MISBEHAVING FLOWS
IN A NETWORK

<u>Customer No. 43490</u>

RESPONSE TO OFFICE ACTION UNDER 37 C.F.R. §1.111

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

Sir:

This RESPONSE is in reply to the Office Action mailed August 19, 2010. The time for response was set for three months and ended on November 19, 2010. A three-month extension of time is hereby requested and the required fee submitted. The fee for the addition of one new independent claim is hereby submitted. February 19, 2011 fell on a Saturday, and the following Monday was a federal holiday. This response filed on Tuesday February 22, 2011, is therefore timely.

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Remarks

These remarks are in response to the Office Action mailed August 19, 2010. The total number of claims submitted for consideration is forty-four (44).

Amendments to the Claims

Applicant respectfully amends the claims as follows. A clean copy of the amended claims is included in Appendix A.

What is claimed is:

1. (Currently Amended)	A machine implemented method for processing a flow, the flow comprising a series of information packets, the method comprising:

maintaining a set of behavioral statistics for the flow, wherein the set of behavioral statistics [[are]] is updated based on each information packet belonging to the flow, as each information packet[[s]] belonging to the flow is [[are]] processed, regardless of the presence or absence of congestion;

determining, based at least partially upon the set of behavioral statistics, whether the flow is exhibiting undesirable behavior; and

in response to a determination that the flow is exhibiting undesirable behavior, enforcing a penalty on the flow.

2. (Original)	The method of claim 1, wherein enforcing the penalty has an effect of correcting the flow's behavior such that the flow exhibits less undesirable behavior.

3. (Original)	The method of claim 1, wherein enforcing the penalty comprises:

imposing an increased drop rate on the flow such that the information packets belonging to the flow have a higher probability of being dropped than information packets belonging to other flows that do not exhibit undesirable behavior.

4. (Original)   The method of claim 1, wherein the penalty is enforced when a congestion condition is encountered.

5. (Currently Amended)   A machine implemented method for processing a flow, the flow comprising a series of information packets, the method comprising:

maintaining a set of behavioral statistics for the flow, wherein the set of behavioral statistics [[are]] is updated based on each information packet belonging to the flow, as each information packet[[s]] belonging to the flow [[are]] is processed, regardless of the presence or absence of congestion; and

computing, based at least partially upon the set of behavioral statistics, a badness factor for the flow, wherein the badness factor provides an indication of whether the flow is exhibiting undesirable behavior.

6. (Original)   The method of claim 5, wherein the badness factor also provides an indication of a degree to which the flow is behaving undesirably.

7. (Original)   The method of claim 6, further comprising:

determining, based at least partially upon the badness factor, a penalty to impose on the flow.

8. (Original)   The method of claim 7, further comprising: enforcing the penalty on the flow.

9. (Original)   The method of claim 8, wherein enforcing the penalty on the flow causes the flow to exhibit less undesirable behavior, thereby, causing the badness factor of the flow to improve.

10. (Original) The method of claim 8, wherein the penalty is enforced on the flow when a congestion condition is encountered.

11. (Original) The method of claim 8, wherein no penalty is enforced on the flow unless a congestion condition is encountered, regardless of how undesirably the flow is behaving.

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12. (Original) The method of claim 8, wherein the penalty is determined and enforced on the flow even when no congestion condition is encountered.

13. (Original) The method of claim 8, wherein determining the penalty comprises:

　　determining an increased drop rate to impose on one or more information packets

　　belonging to the flow.

14. (Original) The method of claim 13, wherein enforcing the penalty comprises:

　　imposing the increased drop rate on the flow such that the information packets belonging

　　to the flow have a higher probability of being dropped than information packets

　　belonging to other flows that do not exhibit undesirable behavior.

15. (Original) The method of claim 5, wherein the set of behavioral statistics comprises a measure T of how much total information has been contained in all of the information packets belonging to the flow that have been forwarded up to a current point in time.

16. (Original) The method of claim 5, wherein the set of behavioral statistics comprises a measure L of how long the flow has been in existence up to a current point in time.

17. (Original) The method of claim 16, wherein the set of behavioral statistics comprises a rate R of information transfer for the flow, wherein R is derived by dividing T by L.

18. (Original) The method of claim 5, wherein the set of behavioral statistics comprises an average size for the information packets belonging to the flow.

19. (Original) The method of claim 5, wherein maintaining the set of behavioral statistics comprises:

　　receiving a particular information packet belonging to the flow;

　　determining whether to forward the particular information packet to a destination; and

in response to a determination to forward the particular information packet to the destination, updating the set of behavioral statistics to reflect processing of the particular information packet.

20. (Original) The method of claim 5, wherein maintaining the set of behavioral statistics comprises:

receiving a particular information packet belonging to the flow; and

updating the set of behavioral statistics to reflect processing of the particular information packet, regardless of whether the particular information packet is discarded or forwarded to a destination.

21. (Currently Amended)   A misbehaving flow manager (MFM) for processing a flow, the flow comprising a series of information packets, the MFM comprising:

means for maintaining a set of behavioral statistics for the flow, wherein the set of behavioral statistics [[are]] is updated based on each information packet belonging to the flow, as each information packet[[s]] belonging to the flow [[are]] is processed, regardless of the presence or absence of congestion;

means for determining, based at least partially upon the set of behavioral statistics, whether the flow is exhibiting undesirable behavior; and

means for enforcing, in response to a determination that the flow is exhibiting undesirable behavior, a penalty on the flow.

22. (Original) The MFM of claim 21, wherein enforcing the penalty has an effect of correcting the flow's behavior such that the flow exhibits less undesirable behavior.

23. (Original) The MFM of claim 21, wherein the means for enforcing the penalty comprises:

means for imposing an increased drop rate on the flow such that the information packets

belonging to the flow have a higher probability of being dropped than information

packets belonging to other flows that do not exhibit undesirable behavior.

24. (Original) The MFM of claim 21, wherein the penalty is enforced when a congestion

condition is encountered.

25. (Currently Amended)   A misbehaving flow manager (MFM) for processing a flow, the

flow comprising a series of information packets, the MFM comprising:

means for maintaining a set of behavioral statistics for the flow, wherein the set of

behavioral statistics [[are]] is updated based on each information packet belonging to the

flow, as each information packet[[s]] belonging to the flow [[are]] is processed,

regardless of the presence or absence of congestion; and

means for computing, based at least partially upon the set of behavioral statistics, a

badness factor for the flow, wherein the badness factor provides an indication of whether

the flow is exhibiting undesirable behavior.

26. (Original) The MFM of claim 25, wherein the badness factor also provides an indication of a

degree to which the flow is behaving undesirably.

27. (Original) The MFM of claim 26, further comprising:

means for determining, based at least partially upon the badness factor, a penalty to

impose on the flow.

28. (Original) The MFM of claim 27, further comprising: means for enforcing the penalty on the

flow.

29. (Original) The MFM of claim 28, wherein enforcing the penalty on the flow causes the flow

to exhibit less undesirable behavior, thereby, causing the badness factor of the flow to improve.

30. (Original) The MFM of claim 28, wherein the penalty is enforced on the flow when a congestion condition is encountered.

31. (Original) The MFM of claim 28, wherein no penalty is enforced on the flow unless a congestion condition is encountered, regardless of how undesirably the flow is behaving.

32. (Original) The MFM of claim 28, wherein the penalty is determined and enforced on the flow even when no congestion condition is encountered.

33. (Original) The MFM of claim 28, wherein the means for determining the penalty comprises:

means for determining an increased drop rate to impose on one or more information packets belonging to the flow.

34. (Original) The MFM of claim 33, wherein the means for enforcing the penalty comprises:

means for imposing the increased drop rate on the flow such that the information packets belonging to the flow have a higher probability of being dropped than information packets belonging to other flows that do not exhibit undesirable behavior.

35. (Original) The MFM of claim 25, wherein the set of behavioral statistics comprises a measure T of how much total information has been contained in all of the information packets belonging to the flow that have been forwarded up to a current point in time.

36. (Original) The MFM of claim 25, wherein the set of behavioral statistics comprises a measure L of how long the flow has been in existence up to a current point in time.

37. (Original) The MFM of claim 36, wherein the set of behavioral statistics comprises a rate R of information transfer for the flow, wherein R is derived by dividing T by L.

38. (Original) The MFM of claim 25, wherein the set of behavioral statistics comprises an average size for the information packets belonging to the flow.

Attorney Docket No.: SABLE-01008   Response to Office Action

39. (Original) The MFM of claim 25, wherein the means for maintaining the set of behavioral statistics comprises:

means for receiving a particular information packet belonging to the flow;

means for determining whether to forward the particular information packet to a destination; and

means for updating, in response to a determination to forward the particular information packet to the destination, the set of behavioral statistics to reflect processing of the particular information packet.

40. (Original) The MFM of claim 25, wherein the means for maintaining the set of behavioral statistics comprises:

means for receiving a particular information packet belonging to the flow; and

means for updating the set of behavioral statistics to reflect processing of the particular information packet, regardless of whether the particular information packet is discarded or forwarded to a destination.

41. (Currently Amended)   A machine-implemented method for processing a single flow, the flow comprising a plurality of packets, and the method comprising:

creating a flow block as the first packet of a flow is processed by a single router;

said flow block being configured to store payload-content-agnostic behavioral statistics pertaining to said flow, regardless of the presence or absence of congestion;

said router updating said flow block with the payload-content-agnostic behavioral statistics of each packet belonging to said flow, as each packet[[s]] belonging to said flow [[are]] is processed by said router, regardless of the presence or absence of congestion;

Response to Office Action