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## NOTICE OF ALLOWANCE AND FEE(S) DUE

43490 7590 06/20/2011  
WEST & ASSOCIATES, A PC  
2815 Mitchell Drive  
Suite 209  
WALNUT CREEK, CA 94598

EXAMINER

ZHOU, YONG

ART UNIT

PAPER NUMBER

2477

DATE MAILED: 06/20/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/497,002

07/31/2006

Surya K. Pappu

SABLE-01023

6030

TITLE OF INVENTION: IDENTIFYING FLOWS BASED ON BEHAVIOR CHARACTERISTICS AND APPLYING USER-DEFINED ACTIONS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	09/20/2011

**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.**

### HOW TO REPLY TO THIS NOTICE:

#### I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

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: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax** **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

43490 7590 06/20/2011  
**WEST & ASSOCIATES, A PC**  
**2815 Mitchell Drive**  
**Suite 209**  
**WALNUT CREEK, CA 94598**

## Certificate of Mailing or Transmission

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 facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/497,002

07/31/2006

Surya K. Pappu

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TITLE OF INVENTION: IDENTIFYING FLOWS BASED ON BEHAVIOR CHARACTERISTICS AND APPLYING USER-DEFINED ACTIONS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	09/20/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
ZHOU, YONG	2477	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 03-02 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,

1 \_\_\_\_\_

(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.

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 has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(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

4a. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

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

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_

This collection of information 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 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, 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.

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IPR2018-00594



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/497,002	07/31/2006	Surya K. Pappu	SABLE-01023	6030

43490 7590 06/20/2011  
WEST & ASSOCIATES, A PC  
2815 Mitchell Drive  
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EXAMINER
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ZHOU, YONG

ART UNIT	PAPER NUMBER
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2477

DATE MAILED: 06/20/2011

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

The Patent Term Adjustment to date is 244 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 244 day(s).

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 Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

## 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 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.

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	11/497,002	PAPPU ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	YONG ZHOU	2477	

**-- 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 an RCE filed 5/16/2011.
2. ☒ The allowed claim(s) is/are 32, 33 and 34, renumbered 1, 3 and 2.
3. ☐ 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 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.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ 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)**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. <input type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br/>Paper No./Mail Date _____</li> <li>4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br/>of Biological Material</li> </ol> | <ol style="list-style-type: none"> <li>5. <input type="checkbox"/> Notice of Informal Patent Application</li> <li>6. <input type="checkbox"/> Interview Summary (PTO-413),<br/>Paper No./Mail Date _____.</li> <li>7. <input type="checkbox"/> Examiner's Amendment/Comment</li> <li>8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance</li> <li>9. <input type="checkbox"/> Other _____.</li> </ol> |
|---|---|

/Yong Zhou/  
Primary Examiner, Art Unit 2477

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application

Inventor(s): Pappu, Surya K., et al.

Appln. No.: 11/497,002

Confirm. No.: 6030

**PATENT APPLICATION**

Art Unit: 2477

Examiner: Zhou, Yong

Filed: 07/31/2006

Title: IDENTIFYING FLOWS BASED ON  
BEHAVIOR CHARACTERISTICS AND  
APPLYING USER-DEFINED ACTIONS

**Customer No. 43490**

**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 November 15, 2010. The time for response was set for three months and ended on February 15, 2011. A three-month extension of time is hereby requested and the required fee submitted. A Request for Continued Examination is also requested and the required fees submitted herewith. May 15, 2011 fell on a Sunday. This response filed on Monday, May 16, 2011, is therefore timely.

### **Summary of Examiner Interview**

On April 11, 2011, a telephonic interview with Examiner Shah was conducted specifically regarding the Office Action mailed on November 15, 2010. The cited prior art was discussed and compared to the present application. Amendments were proposed that were seen to possibly place the claims in condition for allowance. This RESPONSE therefore sets forth the amended claims based on the aforementioned discussion.

**Remarks**

These remarks are in response to the Office Action mailed November 15, 2010. The total number of claims submitted for consideration is thirty four (34).



### **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. (Cancelled)
2. (Cancelled)
3. (Cancelled)
4. (Cancelled)
5. (Cancelled)
6. (Cancelled)
7. (Cancelled)
8. (Cancelled)
9. (Cancelled)
10. (Cancelled)
11. (Cancelled)
12. (Cancelled)
13. (Cancelled)
14. (Cancelled)
15. (Cancelled)
16. (Cancelled)
17. (Cancelled)
18. (Cancelled)
19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (Cancelled)

32. (Currently Amended) A machine-implemented method for the ~~payload-content agnostic processing~~ identification and handling of a single application flow, the flow comprising a plurality of information packets, and the method comprising:

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

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

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

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

heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block; and

upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics;  
wherein said payload-content agnostic behavioral statistics for said flow are calculated by said router;

wherein said payload-content agnostic behavioral statistics reflect the empirical behavior of said flow;

wherein at least one of said payload-content agnostic behavioral statistics is chosen from the group consisting of: total byte count accumulated for the flow, flow life duration, average rate of flow, average packet size, average packet rate, average inter-packet gap, instantaneous flow rate, and moving average flow rate.

33. (Currently Amended) A machine-implemented method for the ~~payload-content agnostic processing~~ identification and handling of a single application flow, the flow comprising a plurality of information packets, and the method comprising:

creating a flow block as the first packet of a flow is processed by a router;  
said flow block being adapted to store solely payload-content agnostic behavioral statistics about said flow;  
updating said flow block with the flow's payload-content agnostic behavioral statistics as packets belonging to said flow are processed by said router;  
said flow being incapable of being identified by header information alone;

heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block; and  
upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics;  
wherein said payload-content agnostic behavioral statistics for said flow are calculated by said router;  
wherein said payload-content agnostic behavioral statistics reflect the empirical behavior of said flow;  
wherein said payload-content agnostic behavioral statistics are chosen from the group consisting of: total byte count accumulated for the flow, flow life duration, average rate of flow, average packet size, average packet rate, average inter-packet gap, instantaneous flow rate, and moving average flow rate.

34. (Currently Amended) The method of claim 32, ~~wherein said object further comprises a flow manager~~ wherein said flow block is created by utilizing header information from said first packet of said flow.

### **Response to Rejections under 35 USC §112**

Claim 34 was rejected under 35 U.S.C. §112, second paragraph, as failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 34 is currently amended and no longer claims an “object.” Therefore, Application respectfully requests that the rejection to this claim with withdrawn.

### **Response to Rejections under 35 USC §103**

Claims 32-34 were rejected under 35 USC §103(a) as being unpatentable over Maher, Robert Daniel III et al. (US 2003/0118029, hereinafter Maher) in view of Odakura, Yasuhiro et al. (US 2004/0064607, hereinafter Odakura). The prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2143. Maher does not teach all the limitations of the rejected claims.

Claims 32 and 33 are currently amended and now teach “wherein said payload-content agnostic behavioral statistics reflect the empirical behavior of said flow.” An applicant is entitled to be his or her own lexicographer (MPEP 2111.01). In accordance with Dictionary.com, the definition of “empirical” is “depending upon experience or observation alone.” Neither Maher nor Odakura teach or suggest payload-content agnostic behavioral statistics that reflect the empirical behavior of the flow. Moreover, neither reference teaches the specific behavioral statistics enumerated in claims 32 and 33: “wherein at least one of said payload-content agnostic behavioral statistics is chosen from the group consisting of: total byte count accumulated for the flow, flow life duration, average rate of flow, average packet size, average packet rate, average inter-packet gap, instantaneous flow rate, and moving average flow rate.”

Additionally, claims 32 and 33 are currently amended to specify: “said flow being incapable of being identified by header information alone.” Such limitation is not taught or suggested by Maher or Odakura.

In light of the above, Applicant asserts that Claims 32 and 33 are not taught or suggested by Maher and Odakura, and respectfully requests that the rejections to these claims be withdrawn.

Claim 34 was also rejected under 35 USC §103(a). Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. 37 CFR 1.75. Claim 34 is currently amended and depends from currently amended claim 32, which, as shown above, is not taught or suggested by Maher in view of Odakura.

### **Conclusion**

Applicant respectfully asserts that the cited references do not render the claims unpatentable, either singularly or in combination. In light of the above, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowed and a Notice of Allowance is earnestly solicited. The Examiner is respectfully requested to telephone the undersigned if she can assist in any way in expediting the issuance of a patent.

Respectfully submitted,

By: /Sara Dirvianskis/  
Sara Dirvianskis  
Reg. No. 62613

Dated: May 16, 2011

West & Associates, A PC  
2815 Mitchell Drive, Suite 209  
Walnut Creek, CA 94598  
(925) 262-2220

**Appendix A: Clean Copy of Amended Claims**



What is claimed is:

1. (Cancelled)
2. (Cancelled)
3. (Cancelled)
4. (Cancelled)
5. (Cancelled)
6. (Cancelled)
7. (Cancelled)
8. (Cancelled)
9. (Cancelled)
10. (Cancelled)
11. (Cancelled)
12. (Cancelled)
13. (Cancelled)
14. (Cancelled)
15. (Cancelled)
16. (Cancelled)
17. (Cancelled)
18. (Cancelled)
19. (Cancelled)
20. (Cancelled)
21. (Cancelled)
22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (Cancelled)

32. (Currently Amended) A machine-implemented method for the identification and handling of a single application flow, the flow comprising a plurality of information packets, and the method comprising:

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

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

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

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

heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block; and

upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said

flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics;  
wherein said payload-content agnostic behavioral statistics for said flow are calculated by said router;  
wherein said payload-content agnostic behavioral statistics reflect the empirical behavior of said flow;  
wherein at least one of said payload-content agnostic behavioral statistics is chosen from the group consisting of: total byte count accumulated for the flow, flow life duration, average rate of flow, average packet size, average packet rate, average inter-packet gap, instantaneous flow rate, and moving average flow rate.

33. (Currently Amended) A machine-implemented method for the identification and handling of a single application flow, the flow comprising a plurality of information packets, and the method comprising:

creating a flow block as the first packet of a flow is processed by a router;  
said flow block being adapted to store solely payload-content agnostic behavioral statistics about said flow;  
updating said flow block with the flow's payload-content agnostic behavioral statistics as packets belonging to said flow are processed by said router;  
said flow being incapable of being identified by header information alone;  
heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block; and

upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics;  
wherein said payload-content agnostic behavioral statistics for said flow are calculated by said router;  
wherein said payload-content agnostic behavioral statistics reflect the empirical behavior of said flow;  
wherein said payload-content agnostic behavioral statistics are chosen from the group consisting of: total byte count accumulated for the flow, flow life duration, average rate of flow, average packet size, average packet rate, average inter-packet gap, instantaneous flow rate, and moving average flow rate.

34. (Currently Amended) The method of claim 32, wherein said flow block is created by utilizing header information from said first packet of said flow.



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43490 7590 11/15/2010 WEST & ASSOCIATES, A PC 1255 Treat Blvd. 3rd Floor WALNUT CREEK, CA 94597			EXAMINER ZHOU, YONG	
			ART UNIT 2477	PAPER NUMBER
			NOTIFICATION DATE 11/15/2010	DELIVERY MODE 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

<b>Office Action Summary</b>	<b>Application No.</b> 11/497,002	<b>Applicant(s)</b> PAPPU ET AL.	
	<b>Examiner</b> YONG ZHOU	<b>Art Unit</b> 2477	

**-- 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 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 14 September 2010.
- 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) 32-34 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) 32-34 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) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 34** recites a limitation "said object". There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

3. 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 negated by the manner in which the invention was made.

4. Claims 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher et al. (US 2003/0118029, hereinafter Maher) in view of Odakura et al. (US 2004/0064607, hereinafter Odakura).

**Regarding claim 32**, Maher teaches a machine-implemented method for payload-content agnostic processing a single flow, the flow comprising a plurality of information packets, and the method comprising:

creating a flow block as the first packet of a flow is processed by a router ([0024], lines 22-29, [0027], lines 1-11, [0028], lines 1-12, wherein the header information of a data received packet is scanned to identify the type, or protocol, of the data packet, which is used to determine routing information as well as to create a session ID using predetermined attributes of the data packet);

said flow block being adapted to store payload-content agnostic behavioral statistics about said flow ([0008], lines 17-22, [0030], lines 1-3, [0048], line 1, wherein once the traffic type is determined and a session ID is created, the statistics and state awareness of the individual traffic flow can be stored, the statistics information obtained from the packet header is payload-agnostic);

updating said flow block with the flow's payload-content agnostic behavioral statistics as packets belonging to said flow are processed by said router ([0027], lines 8-11, [0028], lines 12-14, [0030], lines 1-7, [0048], lines 1-7, wherein the routing and state information is updated as the successive packets are processed and header information is scanned);

heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block ([0008], lines 5-22, [0022], lines 4-7, [0032], lines 1-9, wherein the policies are defined to enforce the terms of the service level agreements such as the resource allocation and



particular service levels. This is accomplished by the traffic flow scanning processor determining a treatment for each data packet based on the scanning and preprogrammed policies. The statistics are used to determine whether the service levels set out in the service agreement are met); and

upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics ([0008], lines 19-27, [0032], lines 3-9, [0059], lines 1-10, wherein once the subscriber and type of traffic have been identified, the policies for that subscriber can be enforced and events or statistics can be logged. A treatment for each data packet is determined based on the scanning and preprogrammed policies);

wherein said payload-content agnostic behavioral statistics for said flow are collected by said router ([0039], lines 10-13, wherein the statistics are collected by the flow management processor of the router).

However, Maher does not expressly teach that said behavioral statistics are calculated by the router.

Nevertheless, Odakura teaches that the statistics comprises the transfer rate calculation block calculates a time required to transfer one packet on the basis of the difference between the reception times of the current and previous packets. The block then divides the data size per packet by the calculated required time, thus instantaneously calculating a data transfer rate at that time ([0038], lines 6-14).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Odakura into the Maher invention to include in the statistics the instantaneous packet data rate calculated from the packet size and inter-packet arrival time to adapt to the network transmission characteristics.

**Regarding claim 33**, Maher teaches a machine-implemented method for processing a single flow, the flow comprising a plurality of information packets, and the method comprising:

creating a flow block as the first packet of a flow is processed by a router ([0024], lines 22-29, [0027], lines 1-11, [0028], lines 1-12, wherein the header information of a data received packet is scanned to identify the type, or protocol, of the data packet, which is used to determine routing information as well as to create a session ID using predetermined attributes of the data packet);

said flow block being adapted to store payload-content agnostic behavioral statistics about said flow ([0008], lines 17-22, [0030], lines 1-3, [0048], line 1, wherein once the traffic type is determined and a session ID is created, the statistics and state awareness of the individual traffic flow can be stored, the statistics information obtained from the packet header is payload-agnostic);

updating said flow block with the flow's payload-content agnostic behavioral statistics as packets belonging to said flow are processed by said router ([0027], lines 8-11, [0028], lines 12-14, [0030], lines 1-7, [0048], lines 1-7, wherein the routing and state

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information is updated as the successive packets are processed and header information is scanned);

heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block ([0008], lines 5-22, [0022], lines 4-7, [0032], lines 1-9, wherein the policies are defined to enforce the terms of the service level agreements such as the resource allocation and particular service levels. This is accomplished by the traffic flow scanning processor determining a treatment for each data packet based on the scanning and preprogrammed policies. The statistics are used to determine whether the service levels set out in the service agreement are met); and

upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics ([0008], lines 19-27, [0032], lines 3-9, [0059], lines 1-10, wherein once the subscriber and type of traffic have been identified, the policies for that subscriber can be enforced and events or statistics can be logged. A treatment for each data packet is determined based on the scanning and preprogrammed policies);

wherein said payload-content agnostic behavioral statistics for said flow are collected by said router ([0039], lines 10-13, wherein the statistics are collected by the flow management processor of the router).

However, Maher does not expressly teach that said behavioral statistics are calculated by the router.

Nevertheless, Odakura teaches that the statistics comprises the transfer rate calculation block calculates a time required to transfer one packet on the basis of the difference between the reception times of the current and previous packets. The block then divides the data size per packet by the calculated required time, thus instantaneously calculating a data transfer rate at that time ([0038], lines 6-14).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Odakura into the Maher invention to include in the statistics the instantaneous packet data rate calculated from the packet size and inter-packet arrival time to adapt to the network transmission characteristics.

**Regarding claim 34**, Maher teaches that said object further comprises a flow manager (Fig. 3, # 138, [0036], lines 7-9, flow control port manager).

### ***Response to Arguments***

5. Applicant's arguments, filed September 14, 2010, have been fully considered but they are not persuasive.

Applicant argues that Maher does not teach a machine-implemented method comprising "updating said flow block with the flow's payload-content agnostic behavioral statistics as packets belonging to said flow are processed by said router; [and]

heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block." Rather, Maher expressly teaches a content-aware mechanism.

In response, the Examiner respectfully disagrees with Applicant's arguments. Maher teaches that the routing and state information is updated as the successive packets are processed; the header information of a data received packet is scanned to identify the type, or protocol, of the data packet ([0027], lines 1-11, [0028], lines 12-14, [0030], lines 1-7, [0048], lines 1-7). Since the header information is payload-agnostic, Maher's disclosure meets the claim limitation of "payload-content agnostic". Furthermore, Maher teaches that the policies are defined to enforce the terms of the service level agreements such as the resource allocation and particular service levels. This is accomplished by the traffic flow scanning processor determining a treatment for each data packet based on the scanning and preprogrammed policies. The statistics are used to determine whether the service levels set out in the service agreement are met ([0008], lines 5-22, [0022], lines 4-7, [0032], lines 1-9).

Therefore, in light of the claim language, the Examiner maintains the rejection.

### ***Conclusion***

6. 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.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to YONG ZHOU whose telephone number is (571)270-3451. The examiner can normally be reached on Monday - Friday 8:00am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chirag G. Shah can be reached on 571-272-3144. 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

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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.

/Y. Z./

Examiner, Art Unit 2477

November 5, 2010

/Chirag G Shah/

Supervisory Patent Examiner, Art Unit 2477

**Remarks**

These remarks are in response to the Office Action mailed April 14, 2010. The total number of claims submitted for consideration is thirty four (34).



### **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. (Cancelled)

2. (Cancelled)

3. (Cancelled) ~~The method of claim 32, wherein:~~

~~determining whether at least one user-specified policy is satisfied comprises determining, based on the set of behavioral characteristics, whether the flow represents Voice Over IP (VOIP) traffic; and applying said at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with VOIP traffic.~~

4. (Cancelled) ~~The method of claim 32, wherein determining whether at least one user-specified policy is satisfied comprises determining whether a particular behavioral statistic of the behavioral statistics is both (a) at least as great as a minimum value expressed in a particular policy of the user-specified policies AND (b) no greater than a maximum value expressed in the particular policy.~~

5. (Cancelled) ~~The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a quality of service indicator that is associated with a flow to which the packet belongs, wherein an immediacy with which a routing device forwards the packet is based at least in part on the quality of service indicator.~~

6. (Cancelled) ~~The method of claim 5, wherein changing the quality of service indicator comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein at least one flow type of the first and second flow types indicates to a router that packets that belong to a flow that is associated with said at least one flow type need to be forwarded at no less than a specified rate.~~

7. (Cancelled) ~~The method of claim 5, wherein changing the quality of service indicator comprises changing a priority of the flow from a first priority to a second priority that differs from the first priority, wherein the priority of the flow indicates to a router an extent to which packets that belong to the flow should be dropped when the router needs to drop one or more packets.~~

8. (Cancelled) ~~The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises logging information about the packet.~~

9. (Cancelled) ~~The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises re-routing the packet by forwarding the packet through an egress that is separate from an egress that is associated with a destination that the packet specifies.~~

10. (Cancelled) ~~The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises:~~

~~making a copy of the packet; and~~

~~forwarding the copy through an egress that is separate from an egress that is associated with a destination that the packet specifies.~~

11. (Cancelled) ~~The method of claim 32, wherein applying at least one user specified action relative to at least one packet comprises changing contents of the packet prior to forwarding the packet.~~

12. (Cancelled) ~~The method of claim 11, wherein changing contents of the packet comprises changing contents of a Diffserv Code Point (DSCP) field of an Internet Protocol (IP) header of the packet prior to forwarding the packet.~~

13. (Cancelled) ~~The method of claim 32, wherein storing behavioral statistics for the flow comprises updating an average packet rate indicator that indicates an average rate at which packets belonging to the flow have been processed at a router.~~

14. (Cancelled) ~~The method of claim 32, wherein storing behavioral statistics for the flow comprises updating an average inter packet gap indicator that indicates an average interval of time that has passed between times at which packets belonging to the flow have arrived at a router.~~

15. (Cancelled) ~~The method of claim 32, wherein storing behavioral statistics for the flow comprises updating a moving average rate indicator that indicates an average number of bits that~~

~~have been contained in only those of the flow's packets that have been processed at a router during a specified interval of time that is less than an amount of time that the flow has existed.~~

16. (Cancelled) ~~The method of claim 32, wherein applying at least one user specified action relative to at least one packet comprises changing an aggregate class to which the flow belongs from a first aggregate class to a second aggregate class that is separate from the first aggregate class.~~

17. (Cancelled) ~~The method of claim 32, wherein applying at least one user specified action relative to at least one packet comprises changing a maximum allowable bandwidth associated with the flow from a first bandwidth to a second bandwidth that is different from the first bandwidth.~~

18. (Cancelled) ~~The method of claim 32, wherein:~~  
~~determining whether at least one user specified policy is satisfied comprises: determining (a) whether a life duration of the flow is at least as great as a first threshold value, (b) whether an average bit rate associated with the flow is no greater than a second threshold value, and (c) whether a packet size associated with the flow is no greater than a third threshold value; and in response to determining that (a) the life duration of the flow is at least as great as the first threshold value, (b) the average bit rate associated with the flow is no greater than the second threshold value, and (c) the packet size associated with the flow is no greater than the third threshold value, determining that the flow represents Voice Over IP (VOIP) traffic; and~~

~~wherein applying at least one user specified action comprises applying, relative to at least one packet, one or more actions that are associated with VOIP traffic in response to determining that the flow represents VOIP traffic.~~

19. (Cancelled) ~~The method of claim 32, wherein:~~

~~determining whether at least one user specified policy is satisfied comprises determining, based on the set of behavioral characteristics, whether the flow represents online gaming traffic; and applying at least one user specified action comprises applying, relative to at least one packet, one or more actions that are associated with online gaming traffic.~~

20. (Cancelled) ~~The method of claim 32, wherein determining whether at least one user specified policy is satisfied comprises determining whether a particular behavioral statistic of the behavioral statistics is EITHER (a) at least as great as a minimum value expressed in a particular policy of the user specified policies OR (b) no greater than a maximum value expressed in the particular policy.~~

21. (Cancelled) ~~The method of claim 32, wherein applying at least one user specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a minimum rate at which packets that belong to flows of the first flow type need to be forwarded, and wherein the second flow type is associated with a maximum rate at which packets that belong to flows of the second flow type are allowed to be forwarded.~~

22. (Cancelled) ~~The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a minimum rate at which packets that belong to flows of the first flow type need to be forwarded, and wherein the second flow type is a best effort flow type.~~

23. (Cancelled) ~~The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a maximum rate at which packets that belong to flows of the first flow type are allowed to be forwarded, and wherein the second flow type is associated with a minimum rate at which packets that belong to flows of the second flow type need to be forwarded.~~

24. (Cancelled) ~~The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a maximum rate at which packets that belong to flows of the first flow type are allowed to be forwarded, and wherein the second flow type is a best effort flow type.~~

25. (Cancelled) ~~The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is~~

~~associated with a relatively high priority in a set of priorities, and wherein the second flow type is a best effort flow type.~~

26. (Cancelled) ~~The method of claim 32, wherein applying at least one user specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the second flow type is associated with a relatively high priority in a set of priorities, and wherein the first flow type is a best effort flow type.~~

27. (Cancelled) ~~The method of claim 32, wherein applying at least one user specified action relative to at least one packet comprises shaping traffic of a particular flow to which the packet belongs by (a) delaying, at a current router, one or more particular packets that belong to the particular flow, and (b) sending the one or more particular packets out from the current router at a user provisioned rate as long as the particular packets are within a burst tolerance defined for the particular flow.~~

28. (Cancelled) ~~The method of claim 32, wherein:~~

~~the flow comprises UDP traffic; and~~

~~determining whether at least one user specified policy is satisfied comprises:~~

~~determining (a) whether a life duration of the flow is at least 10 seconds, (b)~~

~~whether an average bit rate associated with the flow is less than 100 Kbps, and (c)~~

~~whether a packet size associated with the flow is less than 230 bytes; and~~

~~in response to determining that (a) the life duration of the flow is at least 10 seconds, (b) the average bit rate associated with the flow is less than 100 Kbps, and (c) the packet size associated with the flow is less than 230 bytes, determining that the flow represents Voice Over IP (VOIP) traffic;~~  
~~wherein applying at least one user specified action comprises applying, relative to at least one packet, one or more actions that are associated with VOIP traffic in response to determining that the flow represents VOIP traffic.~~

29. (Cancelled) ~~The method of claim 32, wherein:~~

~~the flow comprises TCP traffic; and~~

~~determining whether at least one user specified policy is satisfied comprises:~~

~~determining (a) whether a life duration of the flow is at least 10 seconds, (b)~~

~~whether an average bit rate associated with the flow is greater than 32 Kbps, and~~

~~(c) whether a packet size associated with the flow is greater than 1000 bytes; and~~

~~in response to determining that (a) the life duration of the flow is at least 10 seconds, (b) the average bit rate associated with the flow is greater than 32 Kbps, and (c) the packet size associated with the flow is greater than 1000 bytes, determining that the flow represents peer to peer (P2P) traffic;~~

~~wherein applying at least one user specified action comprises applying, relative to at least one packet, one or more actions that are associated with P2P traffic in response to determining that the flow represents P2P traffic.~~

30. (Cancelled) ~~The method of claim 32, wherein:~~



~~the flow comprises UDP traffic; and~~

~~determining whether at least one user-specified policy is satisfied comprises:~~

~~determining (a) whether a life duration of the flow is at least 10 seconds, (b)~~

~~whether an average bit rate associated with the flow is greater than 8 Kbps, (c)~~

~~whether the average bit rate associated with the flow is less than 32 Kbps, (d)~~

~~whether a packet size associated with the flow is greater than 100 bytes, and (e)~~

~~whether the packet size associated with the flow is less than 500 bytes; and~~

~~in response to determining that (a) the life duration of the flow is at least 10 seconds, (b)~~

~~the average bit rate associated with the flow is greater than 8 Kbps, (c) the average bit~~

~~rate associated with the flow is less than 32 Kbps, (d) the packet size associated with the~~

~~flow is greater than 100 bytes, and (e) the packet size associated with the flow is less than~~

~~500 bytes, determining that the flow represents online gaming traffic;~~

~~wherein applying at least one user-specified action comprises applying, relative to at least~~

~~one packet, one or more actions that are associated with online gaming traffic in response~~

~~to determining that the flow represents online gaming traffic.~~

31. (Cancelled) ~~The method of claim 32, wherein:~~

~~determining whether at least one user-specified policy is satisfied comprises:~~

~~determining (a) whether a life duration of the flow is at least as great as a first~~

~~threshold value, (b) whether an average bit rate associated with the flow is greater~~

~~than a second threshold value, (c) whether the average bit rate associated with the~~

~~flow is less than a third threshold value, (d) whether a packet size associated with~~

~~the flow is greater than a fourth threshold value, and (e) whether the packet size associated with the flow is less than a fifth threshold value; and~~  
~~in response to determining that (a) the life duration of the flow is at least as great as the first threshold value, (b) the average bit rate associated with the flow is greater than the second threshold value, (c) the average bit rate associated with the flow is less than the third threshold value, (d) the packet size associated with the flow is greater than the fourth threshold value, and (e) the packet size associated with the flow is less than the fifth threshold value, determining that the flow represents online gaming traffic;~~  
~~wherein applying at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with online gaming traffic in response to determining that the flow represents online gaming traffic.~~

32. (Currently Amended) A machine-implemented method for the payload-content agnostic processing of a single flow, the flow comprising a plurality of information packets, and the method comprising:

creating a flow block as the first packet of a flow is processed by a router;  
said flow block being adapted to store payload-content agnostic behavioral statistics about said flow;  
updating said flow block with the flow's payload-content agnostic behavioral statistics as packets belonging to said flow are processed by said router;  
heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block; and  
upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said

flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics;  
wherein said payload-content agnostic behavioral statistics for said flow are calculated by said router ~~and independent of inter-router data~~.

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

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

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

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

heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block; and

upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics;

wherein said payload-content agnostic behavioral statistics for said flow are calculated by said router.

34. (New) The method of claim 32, wherein said object further comprises a flow manager.

### **Response to Claim Objections Under 37 CFR §1.75(c)**

Claims 3-5, 8-11, and 13-31 were objected to under 37 CFR §1.75(c) as being in improper dependent form for failing to further limit the subject matter of a previous claim.

Claims 3-5, 8-11, and 13-31 are currently cancelled, and Applicant therefore respectfully requests that these objections be withdrawn.

### **Response to Rejections under 35 USC §112**

Claim 32 was rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Specifically, the Office Action stated that “Claim 32 recites a limitation ‘statistics...are...independent of inter-router data’ which was not described in the original specification. It is not clear what the ‘inter-router data’ refers to.”

Claim 32 is currently amended such that “and independent of inter-router data” has been removed. Therefore, claim 32 now complies with 35 U.S.C. §112 and Applicant respectfully requests that the rejection be withdrawn.

### **Response to Rejections under 35 USC §103**

Claims 3, 5-9, 11, 13, 16, 17, 21-27, and 32 were rejected under 35 USC §103(a) as being unpatentable over Maher, Robert Daniel III et al. (US 2003/0118029, hereinafter Maher) in view of Odakura, Yasuhiro et al. (US 2004/0064607, hereinafter Odakura). The prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2143. Maher does not teach all the limitations of the rejected claims.

Claim 32 is currently amended to specify:

“A machine-implemented method for the payload-content agnostic processing of a single flow...comprising...updating said flow block with the flow’s payload-content agnostic behavioral statistics as packets belonging to said flow are processed by said router; heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block.”

Claim 32 was rejected as being unpatentable over Maher in view of Odakura. However, Maher does not teach a machine-implemented method comprising “updating said flow block with the flow’s payload-content agnostic behavioral statistics as packets belonging to said flow are processed by said router; [and] heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block.” Rather, Maher expressly teaches a content-aware mechanism, as stated in Maher, Paragraph 50, lines 6-10:

“[t]he abilities of payload analyzer 110 allow the construction of a network device that is content aware which gives the network device the ability to operate on data packets based on the content of that data packet as has already been described herein”;

and in Maher, Paragraph 48, lines 1-5:

“[s]tate information is stored in session memory 354 and is updated as necessary after data associated with the particular traffic flow is scanned. The state information for each traffic flow represents the content awareness of network apparatus 100 from FIG. 2.”

Moreover, the following Maher citations illustrate that Maher teaches a content-aware system designed to look into both the header AND the payload of each packet, NOT a “method for the payload-content agnostic processing of a single flow”:

- “A network device for enforcing service level agreement is described that is able to scan the contents of entire data packets including header and payload information.” [Maher, Abstract, lines 1-3].
- “The traffic flow scanning processor scans the header and payload information from each data packet, which is used to associate each data packet with a particular subscriber, classify the type of network traffic in the data packet and to enforce the particular policies associated with the subscriber.” [Maher, Abstract, lines 5-10].
- “After data packets have been processed by header processor 104 the data packets, their associated session id and any conclusion formed by the header processor, such as routing or QoS information, are sent on fast-data path 126 to the other half of traffic flow scanning engine 140, payload analyzer 110.” [Maher, paragraph 31, lines 1-6].
- “Payload analyzer 110 is operable to scan the contents of data packets received from header processor 104, particularly the payload contents of the data packets, although header information can also be scanned as required.” [Maher, paragraph 31, lines 8-12].
- “Once the content of the packets have been scanned and a conclusion, or treatment, is reached by traffic flow scanning engine 140, the packets and the associated conclusions of either or both the header processor and the payload analyzer are sent to quality of service (QoS) processor 116.” [Maher, paragraph 33, lines 1-6].

- “As can be seen from the description of FIG. 3, payload analyzer 110 allows the entire contents of any or all data packets received by a network device to be scanned against a database of known signatures.” [Maher, paragraph 50, lines 1-5].

Moreover, the Office action cited Maher Paragraph 30, lines 1-7; and Paragraph 48, lines 1-7, as support for the assertion that Maher teaches or suggests “updating said flow block with the flow’s behavioral statistics as packets belonging to said flow are processed by said router.” However, this element of claim 32 is currently amended to read “updating said flow block with the flow’s payload-content agnostic behavioral statistics as packets belonging to said flow are processed by said router.” Paragraph 30, lines 1-7 of Maher refer to storing of routing tables. Routing tables refer to the next hop or egress interface on which the traffic needs to go out, to reach its destination. However, claim 32 is drawn to heuristics, specifically “payload-content agnostic behavioral statistics”, which are different from routing data. Therefore, the “payload-content agnostic behavioral statistics” referred to in claim 32 are not analogous to the routing data described in Maher, paragraph 30, lines 1-7.

Furthermore, Paragraph 48, lines 1-7 of Maher describes the “state information for each traffic flow represents the content awareness of network apparatus 100.” Claim 32 refers to updating “payload-content agnostic behavioral statistics”, which is in stark contrast to the “content-awareness” method of Maher, paragraph 48, lines 1-7. Moreover, paragraph 48, lines 1-7 describe “state information is stored in session memory and is updated as necessary after data associated with the particular traffic flow is scanned.” This citation makes no mention of maintaining, heuristically, behavior statistics for each packet belonging to a given flow, and therefore it cannot be said to teach or suggest “updating said flow block with the flow’s payload-

content agnostic behavioral statistics as packets belonging to said flow are processed by said router.”

Additionally, the Office Action cites Maher paragraph 8, lines 5-22; paragraph 22, lines 4-7; and paragraph 32, lines 1-9, as support for the assertion that Maher teaches or suggests “heuristically determining whether at least one user-specified policy is satisfied by said behavioral statistics stored in said flow block.” However, as explained above, claim 32 is currently amended to reflect “heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block.” Paragraph 8, lines 5-22 of Maher do not teach or suggest this element of using payload-content agnostic statistics to determine whether a policy is satisfied. Rather, Maher, paragraph 8, lines 3-19 states: “The network device includes memory...The memory also includes policies...The memory is connected to a traffic flow scanning processor which is operable to **scan both the header and payload** of all data packets...to associate it with a particular subscriber and to identify the type and nature of the network traffic. Once the subscriber and type of traffic have been identified, the policies for that subscriber can be enforced.” Thus, the Maher mechanism employs payload-content scanning of all data packets in order to identify and enforce a policy.

With respect to paragraph 22, lines 4-7, this section fails to teach or suggest the use of payload-content agnostic behavioral statistics to heuristically determine whether a policy is satisfied. Rather, the “statistics collected”, referred to in Maher paragraph 22, pertain to statistics gathered by the “traffic flow scanning processor”, which, as discussed above with regard to Maher Paragraph 8, scans “both the header and payload of all data packets.” Thus, the statistics described in Maher, paragraph 22, lines 4-7, are content-aware statistics, and the “payload-



content agnostic behavioral statistics” of claim 32 of the present application are not taught or suggested by Maher.

With respect to paragraph 32, lines 1-9, the “payload analyzer 110” component that is “used to store subscriber information, policies, events and statistics” actually reaches into the payload contents of the data packets [see above citations; see also Maher, paragraph 31, lines 8-10]. Thus, Maher does not teach or suggest “heuristically determining whether at least one user-specified policy is satisfied by said behavioral statistics stored in said flow block.”

Maher Paragraph 8, lines 19-27; and Paragraph 39, lines 10-13, were cited in the Office Action as support for the assertion that Maher teaches “upon determination that at least one user-specified policy is satisfied by said behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said behavioral statistics.” However, as explained above, claim 32 is currently amended to read: “upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics.”

With respect to Paragraph 8, lines 19-27, the “scanning” of data packets refers to scanning “both the header and payload of all data packets flowing through the network device” (See Maher, Paragraph 8, lines 11-14). Thus, the statistics used in Maher to determine treatment of data packets are payload-content aware statistics, whereas claim 32 of the present application is drawn to “payload-content agnostic behavioral statistics.” Moreover, Maher uses subscriber-related payload scanning to determine the type of application or traffic flowing in a network. By

contrast, the behavior heuristics in the present invention are what are used to determine application type and/or traffic type. Thus, the nature of the statistics maintained in Maher and those in the present application are necessarily different.

With respect to Paragraph 39, lines 10-13, the “data and statistics” collected by the “flow management processor 122” are tied to the traffic flow scanning engine 140, which includes payload analyzer 110 (Maher, paragraph 31, lines 1-6). Payload analyzer is “operable to scan the content of data packets received from header processor 104, particularly the payload contents of the data packets” (Maher, paragraph 31, lines 8-10). Thus, the statistics referred to in Paragraph 39 are payload-content aware, in contrast with the “payload-content agnostic behavioral statistics” of claim 32.

As illustrated by the foregoing discussion, the Maher reference teaches a purely content-aware system and fails to teach the “payload-content agnostic” mechanism of claim 32 of the present application. *Moreover*, Maher actually teaches away from a content-agnostic mechanism, as illustrated in Maher, Paragraph 31, lines 8-12: “Payload analyzer 110 **is operable to scan** the contents of data packets received from header processor 104, **particularly the payload contents of the data packets**, although header information can also be scanned as required.”

Therefore, Maher does not render claim 32 obvious, even in combination with Odakura, and Applicant respectfully requests that the rejection to claim 32 be withdrawn.

Claims 3, 5-9, 11, 13, 16, 17, and 21-27 were also rejected under 35 U.S.C. §103 as being unpatentable over Maher in view of Odakura. These claims are currently cancelled. Thus, Applicant respectfully requests that the rejections to these claims be withdrawn.

### **Conclusion**

Applicant respectfully asserts that the cited references do not render the claims unpatentable, either singularly or in combination. In light of the above, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowed and a Notice of Allowance is earnestly solicited. The Examiner is respectfully requested to telephone the undersigned if she can assist in any way in expediting the issuance of a patent.

Respectfully submitted,

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Sara Dirvianskis  
Reg. No. 62613

Dated: September 14, 2010

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**Appendix A: Clean Copy of Amended Claims**

What is claimed is:

1. (Cancelled)
2. (Cancelled)
3. (Cancelled)
4. (Cancelled)
5. (Cancelled)
6. (Cancelled)
7. (Cancelled)
8. (Cancelled)
9. (Cancelled)
10. (Cancelled)
11. (Cancelled)
12. (Cancelled)
13. (Cancelled)
14. (Cancelled)
15. (Cancelled)
16. (Cancelled)
17. (Cancelled)
18. (Cancelled)
19. (Cancelled)
20. (Cancelled)
21. (Cancelled)
22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (Cancelled)

32. (Currently Amended) A machine-implemented method for the payload-content agnostic processing of a single flow, the flow comprising a plurality of information packets, and the method comprising:

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

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

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

heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block; and

upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics;

wherein said payload-content agnostic behavioral statistics for said flow are calculated by said router.

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

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

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

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

heuristically determining whether at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics stored in said flow block; and

upon determination that at least one user-specified policy is satisfied by said payload-content agnostic behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said payload-content agnostic behavioral statistics;

wherein said payload-content agnostic behavioral statistics for said flow are calculated by said router.

34. (New) The method of claim 32, wherein said object further comprises a flow manager.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/497,002	07/31/2006	Surya K. Pappu	SABLE-01023	6030
43490 7590 04/14/2010 WEST & ASSOCIATES, A PC 1255 Treat Blvd. 3rd Floor WALNUT CREEK, CA 94597			EXAMINER ZHOU, YONG	
			ART UNIT 2477	PAPER NUMBER
			NOTIFICATION DATE 04/14/2010	DELIVERY MODE 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



<b>Office Action Summary</b>	<b>Application No.</b> 11/497,002	<b>Applicant(s)</b> PAPPU ET AL.	
	<b>Examiner</b> Yong Zhou	<b>Art Unit</b> 2477	

**-- 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 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 12 March 2010.
- 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) 3-32 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) 3-32 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) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. 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 March 12, 2010 has been entered.

### ***Claim Objections***

**Claims 3-5, 8-11 and 13-31** are objected under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim (they are all dependent from a later claim 32). Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 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.

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3. Claim 32 is rejected under 35 U.S.C. 112, 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(s), at the time the application was filed, had possession of the claimed invention.

**Claim 32** recites a limitation “statistics ... are ... independent of inter-router data” which was not described in the original specification. It is not clear that the “inter-router data” refers to.

### ***Claim Rejections - 35 USC § 103***

4. 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 negated by the manner in which the invention was made.

5. Claims 3, 5-9, 11, 13, 16, 17, 21-27 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher, Robert Daniel III et al. (US 2003/0118029, hereinafter Maher) in view of Odakura, Yasuhiro et al. (US 2004/0064607, hereinafter Odakura).

**Regarding claim 32**, Maher teaches a machine-implemented method for processing a single flow, the flow comprising a plurality of information packets, and the method comprising:

creating a flow block as the first packet of a flow is processed by a router ([0024], lines 22-29, [0027], lines 1-11, [0028], lines 1-12, wherein the header information of a data received packet is scanned to identify the type, or protocol, of the data packet, which is used to determine routing information as well as to create a session ID using predetermined attributes of the data packet);

said flow block being adapted to store payload-content agnostic behavioral statistics about said flow ([0008], lines 17-22, [0030], lines 1-3, [0048], line 1, wherein once the traffic type is determined and a session ID is created, the statistics and state awareness of the individual traffic flow can be stored, the statistics information obtained from the packet header is payload-agnostic);

updating said flow block with the flow's behavioral statistics as packets belonging to said flow are processed by said router ([0028], lines 12-14, [0030], lines 1-7, [0048], lines 1-7, wherein the routing and state information is updated as the successive packets are processed);

heuristically determining whether at least one user-specified policy is satisfied by said behavioral statistics stored in said flow block ([0008], lines 5-22, [0022], lines 4-7, [0032], lines 1-9, wherein the policies are defined to enforce the terms of the service level agreements such as the resource allocation and particular service levels. This is accomplished by the traffic flow scanning processor determining a treatment for each data packet based on the scanning and preprogrammed policies. The statistics are used to determine whether the service levels set out in the service agreement are met);  
and

upon determination that at least one user-specified policy is satisfied by said behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said behavioral statistics ([0008], lines 19-27, [0032], lines 3-9, [0059], lines 1-10, wherein once the subscriber and type of traffic have been identified, the policies for that subscriber can be enforced and events or statistics can be logged. A treatment for each data packet is determined based on the scanning and preprogrammed policies);

wherein said payload-content agnostic behavioral statistics for said flow are collected by said router ([0039], lines 10-13, wherein the statistics are collected by the flow management processor of the router).

However, Maher does not expressly teach that said behavioral statistics are calculated by the router.

Nevertheless, Odakura teaches that the statistics comprises the transfer rate calculation block calculates a time required to transfer one packet on the basis of the difference between the reception times of the current and previous packets. The block then divides the data size per packet by the calculated required time, thus instantaneously calculating a data transfer rate at that time ([0038], lines 6-14).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Odakura into the Maher invention to include in the statistics the instantaneous packet data rate calculated from

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the packet size and inter-packet arrival time to adapt to the network transmission characteristics.

**Regarding claim 3,** Maher further teaches that:

determining whether at least one user-specified policy is satisfied comprises determining, based on the set of behavioral characteristics, whether the flow represents Voice Over IP (VOIP) traffic ([0024], lines 22-29); and

applying said at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with VOIP traffic ([0034], lines 8-13).

**Regarding claim 5,** Maher further teaches that applying at least one user-specified action relative to at least one packet comprises changing a quality of service indicator that is associated with a flow to which the packet belongs, wherein an immediacy with which a routing device forwards the packet is based at least in part on the quality of service indicator ([0008], lines 19-27, ([0034], lines 8-13).

**Regarding claim 6,** Maher further teaches that changing the quality of service indicator comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein at least one flow type of the first and second flow types indicates to a router that packets that belong to a flow that is associated with said at least one flow type need to be forwarded at no less than a specified rate ([0009], lines 3-11).

**Regarding claim 7**, Maher further teaches that changing the quality of service indicator comprises changing a priority of the flow from a first priority to a second priority that differs from the first priority, wherein the priority of the flow indicates to a router an extent to which packets that belong to the flow should be dropped when the router needs to drop one or more packets ([0021], lines 11-15).

**Regarding claim 8**, Maher further teaches that applying at least one user-specified action relative to at least one packet comprises logging information about the packet ([0008], lines 16-19).

**Regarding claim 9**, Maher further teaches that applying at least one user-specified action relative to at least one packet comprises re-routing the packet by forwarding the packet through an egress that is separate from an egress that is associated with a destination that the packet specifies ([0051], lines 17-20).

**Regarding claim 11**, Maher further teaches that applying at least one user-specified action relative to at least one packet comprises changing contents of the packet prior to forwarding the packet ([0038], lines 1-10).

**Regarding claim 13**, Maher further teaches that storing behavioral statistics for the flow comprises updating an average packet rate indicator that indicates an average rate at which packets belonging to the flow have been processed at a router ([0009], lines 3-11, [0055], lines 1-6).

**Regarding claim 16**, Maher further teaches that applying at least one user-specified action relative to at least one packet comprises changing an aggregate class

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to which the flow belongs from a first aggregate class to a second aggregate class that is separate from the first aggregate class ([0009], lines 3-11, [0053], lines 3-7).

**Regarding claim 17**, Maher further teaches that applying at least one user-specified action relative to at least one packet comprises changing a maximum allowable bandwidth associated with the flow from a first bandwidth to a second bandwidth that is different from the first bandwidth ([0024], lines 22-29, [0032], lines 1-9).

**Regarding claims 21-24**, Maher further teaches changing a flow type from type 1 at one rate (or best effort) to type 2 at 2<sup>nd</sup> rate (or best effort) ([0057], lines 1-8).

**Regarding claims 25 and 26**, Maher further teaches changing a flow type from type 1 at relatively high priority (or best effort) to type 2 at best effort (or relatively high priority) ([0021], lines 11-15, [0057], lines 1-8).

**Regarding claim 27**, Maher further teaches that applying at least one user-specified action relative to at least one packet comprises shaping traffic of a particular flow to which the packet belongs represents by (a) delaying, at a current router, one or more particular packets that belong to the particular flow, and (b) sending the one or more particular packets out from the current router at a user-provisioned rate as long as the particular packets are within a burst tolerance defined for the particular flow ([0033], lines 7-12).

6. Claims 4 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Luong, Steven V. (US 6,314,105, hereinafter Luong).



**Regarding claims 4 and 20**, the combination of Maher and Odakura teaches the limitations of claim 32 but fails to teach comparing the particular behavioral statistic with a minimum value and a maximum value.

Luong teaches comparing bit rate with two predetermined thresholds and the second threshold is significantly lower than the first threshold (Fig. 3, col. 3, lines 64-66).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Luong into the Maher invention to include comparison of the value range of the behavioral statistic with min and max thresholds. This combination would produce predictable results.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Sahaya, Anurag et al. (US 2003/0058874, hereinafter Sahaya).

**Regarding claim 10**, the combination of Maher and Odakura teaches the limitations of claim 32.

Maher further teaches forwarding the packet through an egress that is separate from an egress that is associated with a destination that the packet specifies ([0051], lines 17-20).

However, Maher does not specifically teach making and forwarding a copy of the packet.

Sahaya teaches that smart GGSN interface may retain the signaling packet and send a copy of the signaling packet to the proxy ([0084], lines 6-8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Sahaya into the Maher invention to make and forward a copy of the packet. This combination would produce predictable results.

8. Claims 12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Konuma, Ryohei (US 2002/0141339, hereinafter Konuma).

**Regarding claim 12**, the combination of Maher and Odakura teaches the limitations of claim 11 but fails to teach changing contents of a Diffserv Code Point (DSCP) field of an Internet Protocol (IP) header of the packet prior to forwarding the packet.

Konuma teaches that the individual flow detection information may be, for example, an IP layer source address, an IP layer destination address, type-of-service (TOS) information, differentiated services codepoint (DSCP) information, or other information enabling packets to be identified as belonging to a specific individual flow ([0036], lines 10-15).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Konuma into the Maher invention to allocate DSCP value for supporting required quality of service profiles. This combination would produce predictable results.

**Regarding claim 18**, the combination of Maher and Odakura teaches the limitations of claim 32.

Maher further teaches that:

determining whether at least one user-specified policy is satisfied comprises:

determining an average bit rate and a packet size associated with the flow ([0057], lines 1-8, [0058], lines 10-14); and

in response to the determination, determining that the flow represents Voice over IP (VOIP) traffic ([0008], lines 14-17, [0024], lines 22-29); and wherein applying at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with VOIP traffic ([0034], lines 8-13).

However, Maher does not specifically teach comparing flow duration, data rate and packet size to appropriate thresholds for determining flow type.

Konuma teaches that the priority of an individual flow tends to increase or decrease depending on whether its data rate, as measured in bytes per unit time, is less than or greater than the preset value. Flows of sufficient long duration therefore tend to receive either high or low priority, depending both on the rate of packet arrival and the average packet length ([0070], lines 1-7).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Konuma into the Maher invention to compare flow duration, packet rate and size with appropriate threshold in order to determine the flow type such as VoIP. This combination would produce predictable results.

9. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Luft, Siegfried Johannes et al. (US 20060233101, hereinafter Luft).

**Regarding claims 14 and 15**, the combination of Maher and Odakura teaches the limitations of claim 32 but fails to teach updating an average inter-packet gap indicator that indicates an average interval of time that has passed between times at which packets belonging to the flow have arrived at a router

Luft teaches the packet transmission gap or inter-packet gap ([0008], lines 10-13, [0045], lines 7-12).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Luft into the Maher invention to update inter-packet gap. This combination would produce predictable results.

10. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Yonge, Lawrence W. III et al. (US 2004/0136396, hereinafter Yonge).

**Regarding claim 19**, the combination of Maher and Odakura teaches the limitations of claim 32.

Maher further teaches that:

determining whether at least one user-specified policy is satisfied comprises determining, based on the set of behavioral characteristics, whether the flow represents real time or non-real time traffic ([0009], lines 3-6); and

applying at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with the real time or non-real time traffic ([0009], lines 6-11).

However, Maher does not specifically teach online gaming.

Yonge teaches traffic classification with typical parameter values for applications such as gaming, video, VoIP etc. (Table 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Yonge into the Maher invention to specifically include online gaming services. This combination would produce predictable results.

11. Claim 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura, Yonge and Kwon, Ohsuk D. (US 2007/0133524, hereinafter Kwon).

**Regarding claim 28**, the combination of Maher and Odakura teaches the limitations of claim 32. It contains similar limitations as claim 18 except for UDP packets contained in the flow and specific threshold values for the traffic parameter comparison.

Yonge teaches traffic classification with typical parameter values for applications such as gaming, video, VoIP etc.; for example, for VoIP, the bit rate is less than 64 kbps and packet length is less than 500 octets (Table 1).

Kwon teaches that the VoIP client may employ UDP ([0021], lines 14-19) and that VoIP flow duration may be 10-60 seconds ([0045], lines 3-5, [0056], lines 8-10).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Yonge and Kwon into the Maher invention to include UDP packets in the flow and specific threshold values for the traffic parameter comparison. This combination would produce predictable results.

**Regarding claim 29**, the combination of Maher and Odakura teaches the limitations of claim 32. It contains similar limitations as claim 28 except for TCP packets contained in the flow and peer-to-peer traffic.

Yonge further teaches peer-to-peer traffic ([0034], lines 10-13).

Kwon further teaches that the client may employ TCP ([0021], lines 14-19).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further combine teachings from Yonge and Kwon into the Maher invention to include TCP packets in the flow and peer-to-peer traffic. This combination would produce predictable results.

**Regarding claim 30**, the combination of Maher and Odakura teaches the limitations of claim 32. It contains similar limitations as claim 28 except for gaming traffic as taught by Yonge. Therefore, it is rejected for the same reasons.

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12. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Yonge.

**Regarding claim 31**, the combination of Maher and Odakura teaches the limitations of claim 32. It contains similar limitations as claim 18 except for online gaming traffic.

Yonge teaches traffic classification with typical parameter values for applications such as gaming, video, VoIP etc. (Table 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Yonge into the Maher-Odakura invention to specifically include online gaming services. This combination would produce predictable results.

### ***Response to Arguments***

13. Applicant's arguments, filed March 12, 2010, have been fully considered but are moot in view of the new ground(s) of rejection.

See more details above.

### ***Conclusion***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yong Zhou whose telephone number is 571-270-3451. The examiner can normally be reached on Monday - Friday 8:00am - 5:00pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chirag G. Shah can be reached on 571-272-3144. 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.

/Y. Z./  
Yong Zhou  
Examiner, Art Unit 2477

April 9, 2010

/Chirag G Shah/  
Supervisory Patent Examiner, Art Unit 2477



### **Summary of Examiner Interview**

On February 12, 2010, a telephonic interview with Examiner Yong Zhou was conducted specifically regarding the Office Action mailed on November 12, 2009. The cited prior art was discussed and compared to the present application. Amendments were proposed that were seen to overcome the Maher reference and which might possibly place the claims in condition for allowance. This RESPONSE therefore sets forth the amended claims based on the aforementioned discussion.

**Remarks**

These remarks are in response to the Office Action mailed November 12, 2009. The total number of claims submitted for consideration is thirty two (32).

## 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. (Cancelled) ~~A machine implemented method for processing a flow, the flow comprising a plurality of information packets, and the method comprising:~~

~~maintaining a set of behavioral statistics for the flow at least in part by updating the set of~~

~~behavioral statistics as information packets belonging to the flow are processed;~~

~~determining whether at least one user-specified policy is satisfied by the set of behavioral statistics; and~~

~~upon determination that at least one user-specified policy is satisfied by the set of~~

~~behavioral statistics, applying, relative to a packet that belongs to the flow, at least one~~

~~user-specified action that is mapped to at least one user-specified policy which is satisfied by the set of behavioral statistics;~~

~~wherein said set of behavioral statistics comprises an instantaneous flow rate derived by~~

~~dividing the size of the most recently processed packet of the flow by the inter packet~~

~~arrival time gap between the two most recently received packets of the flow.~~

2. (Cancelled)

3. (Currently Amended) The method of claim [[1]] 32, wherein:

determining ~~the set of one or more user-specified policies~~ whether at least one user-specified

policy is satisfied comprises determining, based on the set of behavioral characteristics, whether

the flow represents Voice Over [[LP]] IP (VOIP) traffic; and applying ~~the one or more~~ said at

least one user-specified action[[s]] comprises applying, relative to [[the]] at least one packet, one or more actions that are associated with VOIP traffic.

4. (Currently Amended) The method of claim [[1]] 32, wherein determining ~~the set of one or more user-specified policies~~ whether at least one user-specified policy is satisfied comprises determining whether a particular behavioral statistic of the behavioral statistics is both (a) at least as great as a minimum value expressed in a particular policy of the user-specified policies AND (b) no greater than a maximum value expressed in the particular policy.

5. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more~~ at least one user-specified action[[s]] relative to [[the]] at least one packet comprises changing a quality of service indicator that is associated with a flow to which the packet belongs, wherein an immediacy with which a routing device forwards the packet is based at least in part on the quality of service indicator.

6. (Original) The method of claim 5, wherein changing the quality of service indicator comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein at least one flow type of the first and second flow types indicates to a router that packets that belong to a flow that is associated with said at least one flow type need to be forwarded at no less than a specified rate.

7. (Original) The method of claim 5, wherein changing the quality of service indicator comprises changing a priority of the flow from a first priority to a second priority that differs from the first

priority, wherein the priority of the flow indicates to a router an extent to which packets that belong to the flow should be dropped when the router needs to drop one or more packets.

8. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises logging information about the packet.

9. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises re-routing the packet by forwarding the packet through an egress that is separate from an egress that is associated with a destination that the packet specifies.

10. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises:

making a copy of the packet; and

forwarding the copy through an egress that is separate from an egress that is associated with a destination that the packet specifies.

11. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises changing contents of the packet prior to forwarding the packet.

12. (Original) The method of claim 11, wherein changing contents of the packet comprises changing contents of a Diffserv Code Point (DSCP) field of an Internet Protocol (IP) header of the packet prior to forwarding the packet.

13. (Currently Amended) The method of claim [[1]] 32, wherein ~~maintaining the set of~~ storing behavioral statistics for the flow comprises updating an average packet rate indicator that indicates an average rate at which packets belonging to the flow have been processed at a router.

14. (Currently Amended) The method of claim [[1]] 32, wherein ~~maintaining the set of~~ storing behavioral statistics for the flow comprises updating an average inter-packet gap indicator that indicates an average interval of time that has passed between times at which packets belonging to the flow have arrived at a router.

15. (Currently Amended) The method of claim [[1]] 32, wherein ~~maintaining the set of~~ storing behavioral statistics for the flow comprises updating a moving average rate indicator that indicates an average number of bits that have been contained in only those of the flow's packets that have been processed at a router during a specified interval of time that is less than an amount of time that the flow has existed.

16. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to [[the]] at least one packet comprises changing an aggregate class to which the flow belongs from a first aggregate class to a second aggregate class that is separate from the first aggregate class.

17. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises changing a maximum allowable bandwidth associated with the flow from a first bandwidth to a second bandwidth that is different from the first bandwidth.

18. (Currently Amended) The method of claim [[1]] 32, wherein:  
determining ~~the set of one or more user-specified policies~~ whether at least one user-specified policy is satisfied comprises: determining (a) whether a life duration of the flow is at least as great as a first threshold value, (b) whether an average bit rate associated with the flow is no greater than a second threshold value, and (c) whether a packet size associated with the flow is no greater than a third threshold value; and  
in response to determining that (a) the life duration of the flow is at least as great as the first threshold value, (b) the average bit rate associated with the flow is no greater than the second threshold value, and (c) the packet size associated with the flow is no greater than the third threshold value, determining that the flow represents Voice Over IP (VOIP) traffic; and  
wherein applying ~~the one or more user-specified actions~~ at least one user-specified action comprises applying, relative to ~~[[the]]~~ at least one packet, one or more actions that are associated with VOIP traffic in response to determining that the flow represents VOIP traffic.

19. (Currently Amended) The method of claim [[1]] 32, wherein:

determining ~~the set of one or more user-specified policies~~ whether at least one user-specified policy is satisfied comprises determining, based on the set of behavioral characteristics, whether the flow represents online gaming traffic; and  
applying ~~the one or more user-specified actions~~ at least one user-specified action comprises applying, relative to ~~[[the]]~~ at least one packet, one or more actions that are associated with online gaming traffic.

20. (Currently Amended) The method of claim ~~[[1]]~~ 32, wherein determining ~~the set of one or more user-specified policies~~ whether at least one user-specified policy is satisfied comprises determining whether a particular behavioral statistic of the behavioral statistics is EITHER (a) at least as great as a minimum value expressed in a particular policy of the user-specified policies OR (b) no greater than a maximum value expressed in the particular policy.

21. (Currently Amended) The method of claim ~~[[1]]~~ 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a minimum rate at which packets that belong to flows of the first flow type need to be forwarded, and wherein the second flow type is associated with a maximum rate at which packets that belong to flows of the second flow type are allowed to be forwarded.

22. (Currently Amended) The method of claim ~~[[1]]~~ 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises



changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a minimum rate at which packets that belong to flows of the first flow type need to be forwarded, and wherein the second flow type is a best effort flow type.

23. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a maximum rate at which packets that belong to flows of the first flow type are allowed to be forwarded, and wherein the second flow type is associated with a minimum rate at which packets that belong to flows of the second flow type need to be forwarded.

24. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a maximum rate at which packets that belong to flows of the first flow type are allowed to be forwarded, and wherein the second flow type is a best effort flow type.

25. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the

first flow type, wherein the first flow type is associated with a relatively high priority in a set of priorities, and wherein the second flow type is a best effort flow type.

26. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the second flow type is associated with a relatively high priority in a set of priorities, and wherein the first flow type is a best effort flow type.

27. (Currently Amended) The method of claim [[1]] 32, wherein applying ~~the one or more actions~~ at least one user-specified action relative to ~~[[the]]~~ at least one packet comprises shaping traffic of a particular flow to which the packet belongs ~~represents~~ by (a) delaying, at a current router, one or more particular packets that belong to the particular flow, and (b) sending the one or more particular packets out from the current router at a user-provisioned rate as long as the particular packets are within a burst tolerance defined for the particular flow.

28. (Currently Amended) The method of claim [[1]] 32, wherein:

the flow comprises UDP traffic; and

determining ~~the set of one or more user-specified policies~~ whether at least one user-specified policy is satisfied comprises:

determining (a) whether a life duration of the flow is at least 10 seconds, (b) whether an average bit rate associated with the flow is less than 100 Kbps, and (c) whether a packet size associated with the flow is less than 230 bytes; and

in response to determining that (a) the life duration of the flow is at least 10 seconds, (b) the average bit rate associated with the flow is less than 100 Kbps, and (c) the packet size associated with the flow is less than 230 bytes, determining that the flow represents Voice Over IP (VOIP) traffic; ~~and~~  
wherein applying ~~the one or more user-specified actions~~ at least one user-specified action comprises applying, relative to ~~[[the]]~~ at least one packet, one or more actions that are associated with VOIP traffic in response to determining that the flow represents VOIP traffic.

29. (Currently Amended) The method of claim ~~[[1]]~~ 32, wherein:

the flow comprises TCP traffic; and  
determining ~~the set of one or more user-specified policies~~ whether at least one user-specified policy is satisfied comprises:  
determining (a) whether a life duration of the flow is at least 10 seconds, (b) whether an average bit rate associated with the flow is greater than 32 Kbps, and  
(c) whether a packet size associated with the flow is greater than 1000 bytes; and  
in response to determining that (a) the life duration of the flow is at least 10 seconds, (b) the average bit rate associated with the flow is greater than 32 Kbps, and (c) the packet size associated with the flow is greater than 1000 bytes, determining that the flow represents peer-to-peer (P2P) traffic; ~~and~~  
wherein applying ~~the one or more user-specified actions~~ at least one user-specified action comprises applying, relative to ~~[[the]]~~ at least one packet, one or more actions that are associated with P2P traffic in response to determining that the flow represents P2P traffic.

30. (Currently Amended) The method of claim [[1]] 32, wherein:

the flow comprises UDP traffic; and

determining ~~the set of one or more user-specified policies~~ whether at least one user-specified policy is satisfied comprises:

determining (a) whether a life duration of the flow is at least 10 seconds, (b)

whether an average bit rate associated with the flow is greater than 8 Kbps, (c)

whether[[•]] the average bit rate associated with the flow is less than 32 Kbps, (d)

whether a packet size associated with the flow is greater than 100 bytes, and (e)

whether the packet size associated with the flow is less than 500 bytes; and

in response to determining that (a) the life duration of the flow is at least 10 seconds, (b)

the average bit rate associated with the flow is greater than 8 Kbps, (c) the average bit

rate associated with the flow is less than 32 Kbps, (d) the packet size associated with the

flow is greater than 100 bytes, and (e) the packet size associated with the flow is less than

500 bytes, determining that the flow represents online gaming traffic; ~~and~~

wherein applying ~~the one or more user-specified actions~~ at least one user-specified action

comprises applying, relative to [[the]] at least one packet, one or more actions that are

associated with online gaming traffic in response to determining that the flow represents

online gaming traffic.

31. (Currently Amended) The method of claim [[1]] 32, wherein:

determining ~~the set of one or more user-specified policies~~ whether at least one user-specified policy is satisfied comprises:

determining (a) whether a life duration of the flow is at least as great as a first threshold value, (b) whether an average bit rate associated with the flow is greater than a second threshold value, (c) whether the average bit rate associated with the flow is less than a third threshold value, (d) whether a packet size associated with the flow is greater than a fourth threshold value, and (e) whether the packet size associated with the flow is less than a fifth threshold value; and

in response to determining that (a) the life duration of the flow is at least as great as the first threshold value, (b) the average bit rate associated with the flow is greater than the second threshold value, (c) the average bit rate associated with the flow is less than the third threshold value, (d) the packet size associated with the flow is greater than the fourth threshold value, and (e) the packet size associated with the flow is less than the fifth threshold value, determining that the flow represents online gaming traffic; ~~and~~ wherein applying ~~the one or more user-specified actions~~ at least one user-specified action comprises applying, relative to ~~[[the]]~~ at least one packet, one or more actions that are associated with online gaming traffic in response to determining that the flow represents online gaming traffic.

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

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

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

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

heuristically determining whether at least one user-specified policy is satisfied by said behavioral statistics stored in said flow block; and  
upon determination that at least one user-specified policy is satisfied by said behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said behavioral statistics;  
wherein said payload-content agnostic behavioral statistics for said flow are calculated by said router and independent of inter-router data.

### **Response to Rejections under 35 USC §103**

Claim 1 was rejected under 35 U.S.C. 103(a) as being unpatentable over Maher, Robert Daniel III et al. (US 2003/0118029, hereinafter Maher) in view of Odakura, Yasuhiro et al. (US 2004/0064607, hereinafter Odakura). Claim 1 is currently cancelled and Applicant therefore respectfully requests that the rejection to claim 1 be withdrawn.

Claims 3, 5-9, 11, 13, 16, 17 and 21-27 were also rejected as being unpatentable over Maher in view of Odakura.

Claims 4 and 20 were rejected as being unpatentable over Maher in view of Odakura and Luong, Steven V. (US 6,314,105).

Claim 10 was rejected as being unpatentable over Maher in view of Odakura and Sahaya, Anurag et al. (US 2003/0058874).

Claims 12 and 18 were rejected as being unpatentable over Maher in view of Odakura and Konuma, Ryohei (US 2002/0141339).

Claims 14 and 15 were rejected as being unpatentable over Maher in view of Odakura and Luft, Siegfried Johannes et al. (US 2006/0233101).

Claim 19 was rejected as being unpatentable over Maher in view of Odakura and Yonge, Lawrence W. III et al. (US 2004/0136396).

Claims 28-30 were rejected as being unpatentable over Maher in view of Odakura, Yonge and Kwon, Ohsuk D. (US 2007/0133524).

Claim 31 was rejected as being unpatentable over Maher in view of Odakura and Yonge.

The prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2143. Claims 3-31 are currently amended and are now dependent on new claim 32. Claims in dependent form shall be construed to include all the limitations of the claim

incorporated by reference into the dependent claim. 37 CFR 1.75. No combination of Maher and any other reference teach or suggest all the limitations of claim 32, and therefore do not teach or suggest all the limitations of dependent claims 3-31. Thus, Applicant respectfully requests that the rejections to these claims be withdrawn.



## **Conclusion**

Applicant respectfully asserts that the cited references do not render the claims unpatentable, either singularly or in combination. In light of the above, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowed and a Notice of Allowance is earnestly solicited. The Examiner is respectfully requested to telephone the undersigned if she can assist in any way in expediting the issuance of a patent.

Respectfully submitted,

By: /Sara Dirvianskis/  
Sara Dirvianskis  
Reg. No. 62,613

Dated: March 12, 2010

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**Appendix A: Clean Copy of Amended Claims**

What is claimed is:

1. (Cancelled)

2. (Cancelled)

3. (Currently Amended) The method of claim 32, wherein:

determining whether at least one user-specified policy is satisfied comprises determining, based on the set of behavioral characteristics, whether the flow represents Voice Over IP (VOIP) traffic; and applying said at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with VOIP traffic.

4. (Currently Amended) The method of claim 32, wherein determining whether at least one user-specified policy is satisfied comprises determining whether a particular behavioral statistic of the behavioral statistics is both (a) at least as great as a minimum value expressed in a particular policy of the user-specified policies AND (b) no greater than a maximum value expressed in the particular policy.

5. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a quality of service indicator that is associated with a flow to which the packet belongs, wherein an immediacy with which a routing device forwards the packet is based at least in part on the quality of service indicator.

6. (Original) The method of claim 5, wherein changing the quality of service indicator comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein at least one flow type of the first and second flow types indicates to a

router that packets that belong to a flow that is associated with said at least one flow type need to be forwarded at no less than a specified rate.

7. (Original) The method of claim 5, wherein changing the quality of service indicator comprises changing a priority of the flow from a first priority to a second priority that differs from the first priority, wherein the priority of the flow indicates to a router an extent to which packets that belong to the flow should be dropped when the router needs to drop one or more packets.

8. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises logging information about the packet.

9. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises re-routing the packet by forwarding the packet through an egress that is separate from an egress that is associated with a destination that the packet specifies.

10. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises:

making a copy of the packet; and

forwarding the copy through an egress that is separate from an egress that is associated with a destination that the packet specifies.

11. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing contents of the packet prior to forwarding the packet.

12. (Original) The method of claim 11, wherein changing contents of the packet comprises changing contents of a Diffserv Code Point (DSCP) field of an Internet Protocol (IP) header of the packet prior to forwarding the packet.

13. (Currently Amended) The method of claim 32, wherein storing behavioral statistics for the flow comprises updating an average packet rate indicator that indicates an average rate at which packets belonging to the flow have been processed at a router.

14. (Currently Amended) The method of claim 32, wherein storing behavioral statistics for the flow comprises updating an average inter-packet gap indicator that indicates an average interval of time that has passed between times at which packets belonging to the flow have arrived at a router.

15. (Currently Amended) The method of claim 32, wherein storing behavioral statistics for the flow comprises updating a moving average rate indicator that indicates an average number of bits that have been contained in only those of the flow's packets that have been processed at a router during a specified interval of time that is less than an amount of time that the flow has existed.

16. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing an aggregate class to which the flow belongs from a first aggregate class to a second aggregate class that is separate from the first aggregate class.

17. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a maximum allowable bandwidth associated with the flow from a first bandwidth to a second bandwidth that is different from the first bandwidth.

18. (Currently Amended) The method of claim 32, wherein:  
determining whether at least one user-specified policy is satisfied comprises: determining (a) whether a life duration of the flow is at least as great as a first threshold value, (b) whether an average bit rate associated with the flow is no greater than a second threshold value, and (c) whether a packet size associated with the flow is no greater than a third threshold value; and in response to determining that (a) the life duration of the flow is at least as great as the first threshold value, (b) the average bit rate associated with the flow is no greater than the second threshold value, and (c) the packet size associated with the flow is no greater than the third threshold value, determining that the flow represents Voice Over IP (VOIP) traffic; and wherein applying at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with VOIP traffic in response to determining that the flow represents VOIP traffic.

19. (Currently Amended) The method of claim 32, wherein:  
determining whether at least one user-specified policy is satisfied comprises determining, based on the set of behavioral characteristics, whether the flow represents online gaming traffic; and  
applying at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with online gaming traffic.

20. (Currently Amended) The method of claim 32, wherein determining whether at least one user-specified policy is satisfied comprises determining whether a particular behavioral statistic of the behavioral statistics is EITHER (a) at least as great as a minimum value expressed in a particular policy of the user-specified policies OR (b) no greater than a maximum value expressed in the particular policy.

21. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a minimum rate at which packets that belong to flows of the first flow type need to be forwarded, and wherein the second flow type is associated with a maximum rate at which packets that belong to flows of the second flow type are allowed to be forwarded.

22. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is

associated with a minimum rate at which packets that belong to flows of the first flow type need to be forwarded, and wherein the second flow type is a best effort flow type.

23. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a maximum rate at which packets that belong to flows of the first flow type are allowed to be forwarded, and wherein the second flow type is associated with a minimum rate at which packets that belong to flows of the second flow type need to be forwarded.

24. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a maximum rate at which packets that belong to flows of the first flow type are allowed to be forwarded, and wherein the second flow type is a best effort flow type.

25. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a relatively high priority in a set of priorities, and wherein the second flow type is a best effort flow type.



26. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the second flow type is associated with a relatively high priority in a set of priorities, and wherein the first flow type is a best effort flow type.

27. (Currently Amended) The method of claim 32, wherein applying at least one user-specified action relative to at least one packet comprises shaping traffic of a particular flow to which the packet belongs by (a) delaying, at a current router, one or more particular packets that belong to the particular flow, and (b) sending the one or more particular packets out from the current router at a user-provisioned rate as long as the particular packets are within a burst tolerance defined for the particular flow.

28. (Currently Amended) The method of claim 32, wherein:

the flow comprises UDP traffic; and

determining whether at least one user-specified policy is satisfied comprises:

determining (a) whether a life duration of the flow is at least 10 seconds, (b)

whether an average bit rate associated with the flow is less than 100 Kbps, and (c)

whether a packet size associated with the flow is less than 230 bytes; and

in response to determining that (a) the life duration of the flow is at least 10 seconds, (b)

the average bit rate associated with the flow is less than 100 Kbps, and (c) the packet size

associated with the flow is less than 230 bytes, determining that the flow represents

Voice Over IP (VOIP) traffic;

wherein applying at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with VOIP traffic in response to determining that the flow represents VOIP traffic.

29. (Currently Amended) The method of claim 32, wherein:

the flow comprises TCP traffic; and

determining whether at least one user-specified policy is satisfied comprises:

determining (a) whether a life duration of the flow is at least 10 seconds, (b)

whether an average bit rate associated with the flow is greater than 32 Kbps, and

(c) whether a packet size associated with the flow is greater than 1000 bytes; and

in response to determining that (a) the life duration of the flow is at least 10 seconds, (b)

the average bit rate associated with the flow is greater than 32 Kbps, and (c) the packet

size associated with the flow is greater than 1000 bytes, determining that the flow

represents peer-to-peer (P2P) traffic;

wherein applying at least one user-specified action comprises applying, relative to at least

one packet, one or more actions that are associated with P2P traffic in response to

determining that the flow represents P2P traffic.

30. (Currently Amended) The method of claim 32, wherein:

the flow comprises UDP traffic; and

determining whether at least one user-specified policy is satisfied comprises:

determining (a) whether a life duration of the flow is at least 10 seconds, (b)

whether an average bit rate associated with the flow is greater than 8 Kbps, (c)

whether the average bit rate associated with the flow is less than 32 Kbps, (d) whether a packet size associated with the flow is greater than 100 bytes, and (e) whether the packet size associated with the flow is less than 500 bytes; and in response to determining that (a) the life duration of the flow is at least 10 seconds, (b) the average bit rate associated with the flow is greater than 8 Kbps, (c) the average bit rate associated with the flow is less than 32 Kbps, (d) the packet size associated with the flow is greater than 100 bytes, and (e) the packet size associated with the flow is less than 500 bytes, determining that the flow represents online gaming traffic; wherein applying at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with online gaming traffic in response to determining that the flow represents online gaming traffic.

31. (Currently Amended) The method of claim 32, wherein:

determining whether at least one user-specified policy is satisfied comprises:

determining (a) whether a life duration of the flow is at least as great as a first threshold value, (b) whether an average bit rate associated with the flow is greater than a second threshold value, (c) whether the average bit rate associated with the flow is less than a third threshold value, (d) whether a packet size associated with the flow is greater than a fourth threshold value, and (e) whether the packet size associated with the flow is less than a fifth threshold value; and

in response to determining that (a) the life duration of the flow is at least as great as the first threshold value, (b) the average bit rate associated with the flow is greater than the second threshold value, (c) the average bit rate associated with the flow is less than the

third threshold value, (d) the packet size associated with the flow is greater than the fourth threshold value, and (e) the packet size associated with the flow is less than the fifth threshold value, determining that the flow represents online gaming traffic; wherein applying at least one user-specified action comprises applying, relative to at least one packet, one or more actions that are associated with online gaming traffic in response to determining that the flow represents online gaming traffic.

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

creating a flow block as the first packet of a flow is processed by a router;  
said flow block being adapted to store payload-content agnostic behavioral statistics about said flow;  
updating said flow block with the flow's behavioral statistics as packets belonging to said flow are processed by said router;  
heuristically determining whether at least one user-specified policy is satisfied by said behavioral statistics stored in said flow block; and  
upon determination that at least one user-specified policy is satisfied by said behavioral statistics, applying, to at least one packet belonging to said flow, at least one user-specified action that is mapped to the at least one user-specified policy that is satisfied by said behavioral statistics;  
wherein said payload-content agnostic behavioral statistics for said flow are calculated by said router and independent of inter-router data.



# UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/497,002	07/31/2006	Surya K. Pappu	SABLE-01023	6030
43490 7590 02/23/2010 WEST & ASSOCIATES, A PC 1255 Treat Blvd. 3rd Floor WALNUT CREEK, CA 94597			EXAMINER ZHOU, YONG	
			ART UNIT 2477	PAPER NUMBER
			NOTIFICATION DATE 02/23/2010	DELIVERY MODE 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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SJWEST@ASTOUND.NET  
PATENT@WESTPATENTLAW.COM

<b>Interview Summary</b>	<b>Application No.</b> 11/497,002	<b>Applicant(s)</b> PAPPU ET AL.	
	<b>Examiner</b> Yong Zhou	<b>Art Unit</b> 2477	

All participants (applicant, applicant's representative, PTO personnel):

(1) Yong Zhou. (3) \_\_\_\_.

(2) Sera Dirvianskis. (4) \_\_\_\_.

Date of Interview: 12 February 2010.

Type: a) ☒ Telephonic    b) ☐ Video Conference  
c) ☐ Personal [copy given to: 1) ☐ applicant    2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes    e) ☒ No.  
If Yes, brief description: \_\_\_\_.

Claim(s) discussed: Newly proposed claim.

Identification of prior art discussed: Maher.

Agreement with respect to the claims f) ☐ was reached.    g) ☒ was not reached.    h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: A proposed new claim was discussed which might overcome the reference Maher. However, a final assessment will be made with updated search upon receiving a formal written version of the amendment. No agreement was reached.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Y. Z./ Examiner, Art Unit 2477	/Chirag G Shah/ Supervisory Patent Examiner, Art Unit 2477
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## Summary of Record of Interview Requirements

### Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

#### Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

#### 37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,  
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

#### Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/497,002	07/31/2006	Surya K. Pappu	SABLE-01023	6030
43490	7590	11/12/2009		
WEST & ASSOCIATES, A PC 1255 Treat Blvd. 3rd Floor WALNUT CREEK, CA 94597			EXAMINER ZHOU, YONG	
			ART UNIT 2477	PAPER NUMBER
			NOTIFICATION DATE 11/12/2009	DELIVERY MODE 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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SJWEST@ASTOUND.NET  
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<b>Office Action Summary</b>	<b>Application No.</b> 11/497,002	<b>Applicant(s)</b> PAPPU ET AL.	
	<b>Examiner</b> Yong Zhou	<b>Art Unit</b> 2477	

**-- 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 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 08 September 2009.
- 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) 1 and 3-31 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) 1 and 3-31 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) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. 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 negated by the manner in which the invention was made.

2. Claims 1-3, 5-9, 11, 13, 16, 17 and 21-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher, Robert Daniel III et al. (US 2003/0118029, hereinafter Maher) in view of Odakura, Yasuhiro et al. (US 2004/0064607, hereinafter Odakura).

**Regarding claim 1**, Maher teaches a machine-implemented method for processing a flow, the flow comprising a plurality of information packets ([0033], lines 7-12, wherein the traffic flow management for the stream of data packets is performed), and the method comprising:

maintaining a set of behavioral statistics for the flow at least in part by updating the set of behavioral statistics as information packets belonging to the flow are processed ([0022], lines 4-7, [0024], lines 22-29, [0031], lines 16-22, wherein the statistics and state awareness throughout all of the individual traffic flow can be stored);

determining whether at least one user-specified policy is satisfied by the set of behavioral statistics ([0008], lines 5-22, [0022], lines 4-7, [0032], lines 1-9, wherein the policies are defined to enforce the terms of the service level agreements

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such as the resource allocation and particular service levels. This is accomplished by the traffic flow scanning processor determining a treatment for each data packet based on the scanning and preprogrammed policies. The statistics are used to determine whether the service levels set out in the service agreement are met); and

upon determination that at least one user-specified policy is satisfied by the set of behavioral statistics, applying, relative to a packet that belongs to the flow, at least one user-specified action that is mapped to at least one user-specified policy which is satisfied by the set of behavioral statistics ([0008], lines 19-27, [0032], lines 3-9, [0059], lines 1-10, wherein once the subscriber and type of traffic have been identified, the policies for that subscriber can be enforced and events or statistics can be logged. A treatment for each data packet is determined based on the scanning and preprogrammed policies).

However, Maher does not specifically teach that said set of behavioral statistics comprises an instantaneous flow rate derived by dividing the size of the most recently processed packet of the flow by the inter-packet arrival time gap between the two most recently received packets of the flow.

Nevertheless, Odakura teaches that the statistics comprises the transfer rate calculation block calculates a time required to transfer one packet on the basis of the difference between the reception times of the current and previous packets. The block then divides the data size per packet by the calculated required time, thus instantaneously calculating a data transfer rate at that time ([0038], lines 6-14).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Odakura into the Maher invention to include in the statistics the instantaneous packet data rate calculated from the packet size and inter-packet arrival time to adapt to the network transmission characteristics.

**Regarding claim 3,** Maher further teaches that:

determining the set of one or more user-specified policies comprises determining, based on the set of behavioral characteristics, whether the flow represents Voice Over IP (VOIP) traffic ([0024], lines 22-29); and

applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with VOIP traffic ([0034], lines 8-13).

**Regarding claim 5,** Maher further teaches that applying the one or more actions relative to the packet comprises changing a quality of service indicator that is associated with a flow to which the packet belongs, wherein an immediacy with which a routing device forwards the packet is based at least in part on the quality of service indicator ([0008], lines 19-27, ([0034], lines 8-13).

**Regarding claim 6,** Maher further teaches that changing the quality of service indicator comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein at least one flow type of the first and second flow types indicates to a router that packets that belong to a flow that is

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associated with said at least one flow type need to be forwarded at no less than 6 a specified rate ([0009], lines 3-11).

**Regarding claim 7**, Maher further teaches that changing the quality of service indicator comprises changing a priority of the flow from a first priority to a second priority that differs from the first priority, wherein the priority of the flow indicates to a router an extent to which packets that belong to the flow should be dropped when the router needs to drop one or more packets ([0021], lines 11-15).

**Regarding claim 8**, Maher further teaches that applying the one or more actions relative to the packet comprises logging information about the packet ([0008], lines 16-19).

**Regarding claim 9**, Maher further teaches that applying the one or more actions relative to the packet comprises re-routing the packet by forwarding the packet through an egress that is separate from an egress that is associated with a destination that the packet specifies ([0051], lines 17-20).

**Regarding claim 11**, Maher further teaches that applying the one or more actions relative to the packet comprises changing contents of the packet prior to forwarding the packet ([0038], lines 1-10).

**Regarding claim 13**, Maher further teaches that maintaining the set of behavioral statistics for the flow comprises updating an average packet rate indicator that indicates an average rate at which packets belonging to the flow have been processed at a router ([0009], lines 3-11, [0055], lines 1-6).

**Regarding claim 16**, Maher further teaches that applying the one or more actions relative to the packet comprises changing an aggregate class to which the flow belongs from a first aggregate class to a second aggregate class that is separate from the first aggregate class ([0009], lines 3-11, [0053], lines 3-7).

**Regarding claim 17**, Maher further teaches that applying the one or more actions relative to the packet comprises changing a maximum allowable bandwidth associated with the flow from a first bandwidth to a second bandwidth that is different from the first bandwidth ([0024], lines 22-29, [0032], lines 1-9).

**Regarding claims 21-24**, Maher further teaches changing a flow type from type 1 at one rate (or best effort) to type 2 at 2<sup>nd</sup> rate (or best effort) ([0057], lines 1-8).

**Regarding claims 25 and 26**, Maher further teaches changing a flow type from type 1 at relatively high priority (or best effort) to type 2 at best effort (or relatively high priority) ([0021], lines 11-15, [0057], lines 1-8).

**Regarding claim 27**, Maher further teaches that applying the one or more actions relative to the packet comprises shaping traffic of a particular flow to which the packet belongs represents by (a) delaying, at a current router, one or more particular packets that belong to the particular flow, and (b) sending the one or more particular packets out from the current router at a user-provisioned rate as long as the particular packets are within a burst tolerance defined for the particular flow ([0033], lines 7-12).

3. Claims 4 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Luong, Steven V. (US 6,314,105, hereinafter Luong).

**Regarding claims 4 and 20**, the combination of Maher and Odakura teaches the limitations of claim 1 but fails to teach comparing the particular behavioral statistic with a minimum value and a maximum value.

Luong teaches comparing bit rate with two predetermined thresholds and the second threshold is significantly lower than the first threshold (Fig. 3, col. 3, lines 64-66).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Luong into the Maher-Odakura invention to include comparison of the value range of the behavioral statistic with min and max thresholds. This combination would produce predictable results.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Sahaya, Anurag et al. (US 2003/0058874, hereinafter Sahaya).

**Regarding claim 10**, the combination of Maher and Odakura teaches the limitations of claim 1.

Maher further teaches forwarding the packet through an egress that is separate from an egress that is associated with a destination that the packet specifies ([0051], lines 17-20).

However, Maher-Odakura does not specifically teach making and forwarding a copy of the packet.

Sahaya teaches that smart GGSN interface may retain the signaling packet and send a copy of the signaling packet to the proxy ([0084], lines 6-8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Sahaya into the Maher-Odakura invention to make and forward a copy of the packet. This combination would produce predictable results.

5. Claims 12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Konuma, Ryohei (US 2002/0141339, hereinafter Konuma).

**Regarding claim 12**, the combination of Maher and Odakura teaches the limitations of claim 11 but fails to teach changing contents of a Diffserv Code Point (DSCP) field of an Internet Protocol (IP) header of the packet prior to forwarding the packet.

Konuma teaches that the individual flow detection information may be, for example, an IP layer source address, an IP layer destination address, type-of-service (TOS) information, differentiated services codepoint (DSCP) information, or other information enabling packets to be identified as belonging to a specific individual flow ([0036], lines 10-15).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Konuma into the Maher-Odakura invention to allocate DSCP value for supporting required quality of service profiles. This combination would produce predictable results.



**Regarding claim 18**, the combination of Maher and Odakura teaches the limitations of claim 1.

Maher further teaches that:

determining the set of one or more user-specified policies comprises:

determining an average bit rate and a packet size associated with the flow ([0057], lines 1-8, [0058], lines 10-14); and

in response to the determination, determining that the flow represents Voice over IP (VoIP) traffic ([0008], lines 14-17, [0024], lines 22-29).

However, Maher-Odakura does not specifically teach comparing flow duration, data rate and packet size to appropriate thresholds for determining flow type.

Konuma teaches that the priority of an individual flow tends to increase or decrease depending on whether its data rate, as measured in bytes per unit time, is less than or greater than the preset value. Flows of sufficient long duration therefore tend to receive either high or low priority, depending both on the rate of packet arrival and the average packet length ([0070], lines 1-7).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Konuma into the Maher-Odakura invention to compare flow duration, packet rate and size with appropriate threshold in order to determine the flow type such as VoIP. This combination would produce predictable results.

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6. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Luft, Siegfried Johannes et al. (US 20060233101, hereinafter Luft).

**Regarding claims 14 and 15**, the combination of Maher and Odakura teaches the limitations of claim 1 but fails to teach updating an average inter-packet gap indicator that indicates an average interval of time that has passed between times at which packets belonging to the flow have arrived at a router

Luft teaches the packet transmission gap or inter-packet gap ([0008], lines 10-13, [0045], lines 7-12).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Luft into the Maher-Odakura invention to update inter-packet gap. This combination would produce predictable results.

7. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Yonge, Lawrence W. III et al. (US 2004/0136396, hereinafter Yonge).

**Regarding claim 19**, the combination of Maher and Odakura teaches the limitations of claim 1.

Maher further teaches that:

determining the set of one or more user-specified policies comprises determining, based on the set of behavioral characteristics, whether the flow represents real time or non-real time traffic ([0009], lines 3-6); and

applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with the real time or non-real time traffic ([0009], lines 6-11).

However, Maher-Odakura does not specifically teach online gaming.

Yonge teaches traffic classification with typical parameter values for applications such as gaming, video, VoIP etc. (Table 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Yonge into the Maher-Odakura invention to specifically include online gaming services. This combination would produce predictable results.

8. Claim 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura, Yonge and Kwon, Ohsuk D. (US 2007/0133524, hereinafter Kwon).

**Regarding claim 28**, the combination of Maher and Odakura teaches the limitations of claim 1. It contains similar limitations as claim 18 except for UDP packets contained in the flow and specific threshold values for the traffic parameter comparison.

Yonge teaches traffic classification with typical parameter values for applications such as gaming, video, VoIP etc.; for example, for VoIP, the bit rate is less than 64 kbps and packet length is less than 500 octets (Table 1).

Kwon teaches that the VoIP client may employ UDP ([0021], lines 14-19) and that VoIP flow duration may be 10-60 seconds ([0045], lines 3-5, [0056], lines 8-10).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Yonge and Kwon into the Maher-Odakura invention to include UDP packets in the flow and specific threshold values for the traffic parameter comparison. This combination would produce predictable results.

**Regarding claim 29**, the combination of Maher and Odakura teaches the limitations of claim 1. It contains similar limitations as claim 28 except for TCP packets contained in the flow and peer-to-peer traffic.

Yonge further teaches peer-to-peer traffic ([0034], lines 10-13).

Kwon further teaches that the client may employ TCP ([0021], lines 14-19).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further combine teachings from Yonge and Kwon into the Maher-Odakura invention to include TCP packets in the flow and peer-to-peer traffic. This combination would produce predictable results.

**Regarding claim 30**, the combination of Maher and Odakura teaches the limitations of claim 1. It contains similar limitations as claim 28 except for gaming traffic as taught by Yonge. Therefore, it is rejected for the same reasons.

9. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Odakura and Yonge.

**Regarding claim 31**, the combination of Maher and Odakura teaches the limitations of claim 1. It contains similar limitations as claim 18 except for online gaming traffic.

Yonge teaches traffic classification with typical parameter values for applications such as gaming, video, VoIP etc. (Table 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Yonge into the Maher-Odakura invention to specifically include online gaming services. This combination would produce predictable results.

### ***Response to Arguments***

10. Applicant's arguments, filed September 8, 2009, have been fully considered but are moot in view of the new ground(s) of rejection.

See more details above.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 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.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yong Zhou whose telephone number is 571-270-3451. The examiner can normally be reached on Monday - Friday 8:00am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chirag G. Shah can be reached on 571-272-3144. 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

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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.

/Y. Z./

Yong Zhou

Examiner, Art Unit 2477

November 5, 2009

/Chirag G Shah/

Supervisory Patent Examiner, Art Unit 2477

**Remarks**

These remarks are in response to the Office Action mailed March 5, 2009. The total number of claims submitted for consideration is thirty-one (31).



## **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 plurality of information packets, and the method comprising:

maintaining a set of behavioral statistics for the flow at least in part by updating the set of behavioral statistics as information packets belonging to the flow are processed;

determining ~~a set of one or more user-specified policies that are~~ whether at least one user-specified policy is satisfied by the set of behavioral statistics; and upon determination that at least one user-specified policy is satisfied by the set of behavioral statistics, applying, relative to a packet that belongs to the flow, ~~one or more~~ at least one user-specified action[[s]] that [[are]] is mapped to at least one user-specified policy which is satisfied by the set of behavioral statistics; ~~policies in the set of one or more user-specified policies.~~

wherein said set of behavioral statistics comprises an instantaneous flow rate derived by dividing the size of the most recently processed packet of the flow by the inter-packet arrival time gap between the two most recently received packets of the flow.

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

~~determining the set of one or more user-specified policies comprises determining, based on the set of behavioral characteristics, whether the flow represents a particular type of traffic that has characteristics that are expressed by parameters that are indicated within the one or more user-specified policies; applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with the particular type of traffic.~~

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

determining the set of one or more user-specified policies comprises determining, based on the set of behavioral characteristics, whether the flow represents Voice Over LP (VOIP) traffic; and applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with VOIP traffic.

4. (Original) The method of claim 1, wherein determining the set of one or more user-specified policies comprises determining whether a particular behavioral statistic of the behavioral statistics is both (a) at least as great as a minimum value expressed in a particular policy of the user-specified policies AND (b) no greater than a maximum value expressed in the particular policy.

5. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a quality of service indicator that is associated with a flow

to which the packet belongs, wherein an immediacy with which a routing device forwards the packet is based at least in part on the quality of service indicator.

6. (Original) The method of claim 5, wherein changing the quality of service indicator comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein at least one flow type of the first and second flow types indicates to a router that packets that belong to a flow that is associated with said at least one flow type need to be forwarded at no less than a specified rate.

7. (Original) The method of claim 5, wherein changing the quality of service indicator comprises changing a priority of the flow from a first priority to a second priority that differs from the first priority, wherein the priority of the flow indicates to a router an extent to which packets that belong to the flow should be dropped when the router needs to drop one or more packets.

8. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises logging information about the packet.

9. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises re-routing the packet by forwarding the packet through an egress that is separate from an egress that is associated with a destination that the packet specifies.

10. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises:

making a copy of the packet; and

forwarding the copy through an egress that is separate from an egress that is associated with a destination that the packet specifies.

11. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing contents of the packet prior to forwarding the packet.

12. (Original) The method of claim 11, wherein changing contents of the packet comprises changing contents of a Diffserv Code Point (DSCP) field of an Internet Protocol (IP) header of the packet prior to forwarding the packet.

13. (Original) The method of claim 1, wherein maintaining the set of behavioral statistics for the flow comprises updating an average packet rate indicator that indicates an average rate at which packets belonging to the flow have been processed at a router.

14. (Original) The method of claim 1, wherein maintaining the set of behavioral statistics for the flow comprises updating an average inter-packet gap indicator that indicates an average interval of time that has passed between times at which packets belonging to the flow have arrived at a router.

15. (Original) The method of claim 1, wherein maintaining the set of behavioral statistics for the flow comprises updating a moving average rate indicator that indicates an average number of bits that have been contained in only those of the flow's packets that have been processed at a router during a specified interval of time that is less than an amount of time that the flow has existed.

16. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing an aggregate class to which the flow belongs from a first aggregate class to a second aggregate class that is separate from the first aggregate class.

17. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a maximum allowable bandwidth associated with the flow from a first bandwidth to a second bandwidth that is different from the first bandwidth.

18. (Original) The method of claim 1, wherein:  
determining the set of one or more user-specified policies comprises: determining (a) whether a life duration of the flow is at least as great as a first threshold value, (b) whether an average bit rate associated with the flow is no greater than a second threshold value, and (c) whether a packet size associated with the flow is no greater than a third threshold value; and

in response to determining that (a) the life duration of the flow is at least as great as the first threshold value, (b) the average bit rate associated with the flow is no greater than the second threshold value, and (c) the packet size associated with the flow is no greater than the third threshold value, determining that the flow represents Voice Over IP (VOIP) traffic; and

wherein applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with VOIP traffic in response to determining that the flow represents VOIP traffic.

19. (Original) The method of claim 1, wherein:

determining the set of one or more user-specified policies comprises determining, based on the set of behavioral characteristics, whether the flow represents online gaming traffic; and

applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with online gaming traffic.

20. (Original) The method of claim 1, wherein determining the set of one or more user-specified policies comprises determining whether a particular behavioral statistic of the behavioral statistics is EITHER (a) at least as great as a minimum value expressed in a particular policy of the user-specified policies OR (b) no greater than a maximum value expressed in the particular policy.

21. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a minimum rate at which packets that belong to flows of the first flow type need to be forwarded, and wherein the second flow type is associated with a maximum rate at which packets that belong to flows of the second flow type are allowed to be forwarded.

22. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a minimum rate at which packets that belong to flows of the first flow type need to be forwarded, and wherein the second flow type is a best effort flow type.

23. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a maximum rate at which packets that belong to flows of the first flow type are allowed to be forwarded, and wherein the second flow type is associated with a minimum rate at which packets that belong to flows of the second flow type need to be forwarded.

24. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a maximum rate at which packets that belong to flows of the first flow type are allowed to be forwarded, and wherein the second flow type is a best effort flow type.

25. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a relatively high priority in a set of priorities, and wherein the second flow type is a best effort flow type.

26. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the second flow type is associated with a relatively high priority in a set of priorities, and wherein the first flow type is a best effort flow type.

27. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises shaping traffic of a particular flow to which the packet belongs represents by (a) delaying, at a current router, one or more particular packets that belong to the particular flow, and (b) sending the one or more particular packets out from the



current router at a user-provisioned rate as long as the particular packets are within a burst tolerance defined for the particular flow.

28. (Original) The method of claim 1, wherein:

the flow comprises UDP traffic; and

determining the set of one or more user-specified policies comprises:

determining (a) whether a life duration of the flow is at least 10 seconds,

(b) whether an average bit rate associated with the flow is less than 100

Kbps, and (c) whether a packet size associated with the flow is less than

230 bytes; and

in response to determining that (a) the life duration of the flow is at least 10

seconds, (b) the average bit rate associated with the flow is less than 100 Kbps,

and (c) the packet size associated with the flow is less than 230 bytes, determining

that the flow represents Voice Over IP (VOIP) traffic; and

wherein applying the one or more user-specified actions comprises applying,

relative to the packet, one or more actions that are associated with VOIP traffic in

response to determining that the flow represents VOIP traffic.

29. (Original) The method of claim 1, wherein:

the flow comprises TCP traffic; and

determining the set of one or more user-specified policies comprises:

determining (a) whether a life duration of the flow is at least 10 seconds,

(b) whether an average bit rate associated with the flow is greater than 32

Kbps, and (c) whether a packet size associated with the flow is greater than 1000 bytes; and

in response to determining that (a) the life duration of the flow is at least 10 seconds, (b) the average bit rate associated with the flow is greater than 32 Kbps, and (c) the packet size associated with the flow is greater than 1000 bytes, determining that the flow represents peer-to-peer (P2P) traffic; and

wherein applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with P2P traffic in response to determining that the flow represents P2P traffic.

30. (Original) The method of claim 1, wherein:

the flow comprises UDP traffic; and

determining the set of one or more user-specified policies comprises:

determining (a) whether a life duration of the flow is at least 10 seconds, (b) whether an average bit rate associated with the flow is greater than 8 Kbps, (c) whether the average bit rate associated with the flow is less than 32 Kbps, (d) whether a packet size associated with the flow is greater than 100 bytes, and (e) whether the packet size associated with the flow is less than 500 bytes; and

in response to determining that (a) the life duration of the flow is at least 10 seconds, (b) the average bit rate associated with the flow is greater than 8 Kbps, (c) the average bit rate associated with the flow is less than 32 Kbps, (d) the packet size associated with the flow is greater than 100 bytes, and (e) the packet

size associated with the flow is less than 500 bytes, determining that the flow represents online gaming traffic; and

wherein applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with online gaming traffic in response to determining that the flow represents online gaming traffic.

31. (Original) The method of claim 1, wherein:

determining the set of one or more user-specified policies comprises:

determining (a) whether a life duration of the flow is at least as great as a first threshold value, (b) whether an average bit rate associated with the flow is greater than a second threshold value, (c) whether the average bit rate associated with the flow is less than a third threshold value, (d) whether a packet size associated with the flow is greater than a fourth threshold value, and (e) whether the packet size associated with the flow is less than a fifth threshold value; and

in response to determining that (a) the life duration of the flow is at least as great as the first threshold value, (b) the average bit rate associated with the flow is greater than the second threshold value, (c) the average bit rate associated with the flow is less than the third threshold value, (d) the packet size associated with the flow is greater than the fourth threshold value, and (e) the packet size associated with the flow is less than the fifth threshold value, determining that the flow represents online gaming traffic; and

wherein applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with online gaming traffic in response to determining that the flow represents online gaming traffic.

### **Support for Amended Claim**

Claim 1 is currently amended. Support for “wherein said set of behavioral statistics comprises an instantaneous flow rate derived by dividing the size of the most recently processed packet of the flow by the inter-packet arrival time gap between the two most recently received packets of the flow” can be found in Figure 4 and in paragraph 0035, lines 10-13, of the Detailed Description of the present application.

### **Response to Rejections under 35 U.S.C. §102(b)**

The Office Action rejected claims 1-3, 5-9, 11, 13, 16, 17 and 21-27 as being anticipated by Maher, Robert Daniel III et al. (US 2003/0118029, hereinafter Maher).

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Claim 1 is currently amended and now discloses “said set of behavioral statistics comprises an instantaneous flow rate derived by dividing the size of the most recently processed packet of the flow by the inter-packet arrival time gap between the two most recently received packets of the flow.” Maher does not teach use of an instantaneous flow rate as disclosed in the present application. Additionally, “instantaneous flow rate” is not historically a type of statistical information used in evaluation of flow behavior. Therefore, Maher does not teach every element of currently amended claim 1, and Applicant respectfully requests that the rejection be withdrawn.

Furthermore, the invention disclosed in Maher requires introduction of latency into the processing of packets, such latency being caused by the necessary step of determining to which subscriber the traffic belongs. “The traffic flow scanning processor scans each packet to associate it with a particular subscriber.” [Maher, [0008], lines 14-17]. “The header information is used to identify the data packet with a particular customer or subscriber.” [Maher, [0028], lines 7-9]. This step is necessary because the ‘policies’ as taught by Maher are associated with a particular subscriber. “Once the packet is classified and associated with a subscriber, the method checks for available

bandwidth according to the pre-programmed policies for that subscriber.” [Maher, [0009], lines 6-9]. Thus, a policy cannot be identified and carried out without first identifying the subscriber. The latency caused by this required step is undesirable, as it decreases the efficiency of the system.

By contrast, the present invention comprises evaluating the header information of a packet to determine which flow it belongs to, and then immediately evaluating a set of behavioral statistics and preprogrammed policies. [see ¶¶70-76 of the present application]. The system does not include the undesirable and inefficient subscriber-evaluation procedure. Thus, Maher does not teach a system in which the processing of a packet proceeds directly to collecting and evaluating behavioral statistics immediately after evaluation of header information.

Claims 2-3, 5-9, 11, 13, 16, 17, and 21-27 were also rejected under §102(b) as being anticipated by Maher. Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. 37 C.F.R. 1.75. Claim 2 is currently cancelled. Claims 3, 5-9, 11, 13, 16, 17, and 21-27 depend from claim 1. Therefore, since amended claim 1 is not anticipated by Maher, dependent claims 3, 5-9, 11, 13, 16, 17, and 21-27 are likewise not anticipated by Maher.

#### **Response to Rejections under §103(a)**

Claims 4 and 20 were rejected under §103(a) as being unpatentable over Maher in view of Luong, Steven V. (US Pat. 6,314,105). Claim 10 was rejected under §103(a) as being unpatentable over Maher in view of Sahaya, Anurag et al. (US 2003/0058874). Claims 12 and 18 were rejected under §103(a) as being unpatentable over Maher in view of Konuma (US 2002/0141339). Claims 14 and 15 were rejected under §103(a) as being

unpatentable over Maher in view of Luft (US 2006/0233101). Claim 19 was rejected under §103(a) as being unpatentable over Maher in view of Yonge (US 2004/0136396). Claims 28-30 were rejected under §103(a) as being unpatentable over Maher in view of Kwon (US 2007/0133524). Claim 31 was rejected under §103(a) as being unpatentable over Maher in view of Konuma and Yonge.

These claims are all dependent on currently amended claim 1. As discussed above with reference to the §102(b) rejections, Maher does not teach the “instantaneous flow rate” of currently amended claim 1. Additionally, none of the other cited references (Luong, Sahaya, Konuma, Luft, Yonge, or Kwon) teach or suggest this element. The prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2143. No combination of Maher and any other cited reference teach or suggest the “instantaneous flow rate” element of claim 1, and therefore do not teach or suggest all the claim limitations of dependent claims 4, 10, 12, 14, 15, 18, 19, 20, 28-30, or 31. Applicant therefore requests that the rejections to these claims be withdrawn.



## **Conclusion**

Applicant respectfully asserts that the references cited in the Office Action do not render the claim unpatentable, either single or in combination. In light of the aforementioned discussion and current amendments, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowed. A Notice of Allowance is earnestly solicited.

The Examiner is respectfully requested to telephone the undersigned if she can assist in any way in expediting issuance of a patent.

Respectfully submitted,

Date: September 8, 2009

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**Appendix A: CLEAN COPY OF AMENDED CLAIMS**

What is claimed is:

1. (Currently amended) A machine-implemented method for processing a flow, the flow comprising a plurality of information packets, and the method comprising:

maintaining a set of behavioral statistics for the flow at least in part by updating the set of behavioral statistics as information packets belonging to the flow are processed;

determining whether at least one user-specified policy is satisfied by the set of behavioral statistics; and

upon determination that at least one user-specified policy is satisfied by the set of behavioral statistics, applying, relative to a packet that belongs to the flow, at least one user-specified action that is mapped to at least one user-specified policy which is satisfied by the set of behavioral statistics;

wherein said set of behavioral statistics comprises an instantaneous flow rate derived by dividing the size of the most recently processed packet of the flow by the inter-packet arrival time gap between the two most recently received packets of the flow.

2. (Cancelled)

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

determining the set of one or more user-specified policies comprises determining, based on the set of behavioral characteristics, whether the flow represents Voice Over LP (VOIP) traffic; and applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with VOIP traffic.

4. (Original) The method of claim 1, wherein determining the set of one or more user-specified policies comprises determining whether a particular behavioral statistic of the behavioral statistics is both (a) at least as great as a minimum value expressed in a particular policy of the user-specified policies AND (b) no greater than a maximum value expressed in the particular policy.

5. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a quality of service indicator that is associated with a flow to which the packet belongs, wherein an immediacy with which a routing device forwards the packet is based at least in part on the quality of service indicator.

6. (Original) The method of claim 5, wherein changing the quality of service indicator comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein at least one flow type of the first and second flow types indicates to a router that packets that belong to a flow that is associated with said at least one flow type need to be forwarded at no less than a specified rate.

7. (Original) The method of claim 5, wherein changing the quality of service indicator comprises changing a priority of the flow from a first priority to a second priority that differs from the first priority, wherein the priority of the flow indicates to a router an extent to which packets that belong to the flow should be dropped when the router needs to drop one or more packets.

8. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises logging information about the packet.

9. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises re-routing the packet by forwarding the packet through an egress that is separate from an egress that is associated with a destination that the packet specifies.

10. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises:

making a copy of the packet; and

forwarding the copy through an egress that is separate from an egress that is associated with a destination that the packet specifies.

11. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing contents of the packet prior to forwarding the packet.

12. (Original) The method of claim 11, wherein changing contents of the packet comprises changing contents of a Diffserv Code Point (DSCP) field of an Internet Protocol (IP) header of the packet prior to forwarding the packet.

13. (Original) The method of claim 1, wherein maintaining the set of behavioral statistics for the flow comprises updating an average packet rate indicator that indicates an average rate at which packets belonging to the flow have been processed at a router.

14. (Original) The method of claim 1, wherein maintaining the set of behavioral statistics for the flow comprises updating an average inter-packet gap indicator that indicates an average interval of time that has passed between times at which packets belonging to the flow have arrived at a router.

15. (Original) The method of claim 1, wherein maintaining the set of behavioral statistics for the flow comprises updating a moving average rate indicator that indicates an average number of bits that have been contained in only those of the flow's packets that have been processed at a router during a specified interval of time that is less than an amount of time that the flow has existed.

16. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing an aggregate class to which the flow belongs from a first aggregate class to a second aggregate class that is separate from the first aggregate class.

17. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a maximum allowable bandwidth associated with the

flow from a first bandwidth to a second bandwidth that is different from the first bandwidth.

18. (Original) The method of claim 1, wherein:

determining the set of one or more user-specified policies comprises: determining (a) whether a life duration of the flow is at least as great as a first threshold value, (b) whether an average bit rate associated with the flow is no greater than a second threshold value, and (c) whether a packet size associated with the flow is no greater than a third threshold value; and

in response to determining that (a) the life duration of the flow is at least as great as the first threshold value, (b) the average bit rate associated with the flow is no greater than the second threshold value, and (c) the packet size associated with the flow is no greater than the third threshold value, determining that the flow represents Voice Over IP (VOIP) traffic; and

wherein applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with VOIP traffic in response to determining that the flow represents VOIP traffic.

19. (Original) The method of claim 1, wherein:

determining the set of one or more user-specified policies comprises determining, based on the set of behavioral characteristics, whether the flow represents online gaming traffic; and

applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with online gaming traffic.

20. (Original) The method of claim 1, wherein determining the set of one or more user-specified policies comprises determining whether a particular behavioral statistic of the behavioral statistics is EITHER (a) at least as great as a minimum value expressed in a particular policy of the user-specified policies OR (b) no greater than a maximum value expressed in the particular policy.

21. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a minimum rate at which packets that belong to flows of the first flow type need to be forwarded, and wherein the second flow type is associated with a maximum rate at which packets that belong to flows of the second flow type are allowed to be forwarded.

22. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a minimum rate at which packets that belong to flows of the first flow type need to be forwarded, and wherein the second flow type is a best effort flow type.



23. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a maximum rate at which packets that belong to flows of the first flow type are allowed to be forwarded, and wherein the second flow type is associated with a minimum rate at which packets that belong to flows of the second flow type need to be forwarded.

24. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a maximum rate at which packets that belong to flows of the first flow type are allowed to be forwarded, and wherein the second flow type is a best effort flow type.

25. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein the first flow type is associated with a relatively high priority in a set of priorities, and wherein the second flow type is a best effort flow type.

26. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises changing a flow type of the flow from a first flow type to a

second flow type that differs from the first flow type, wherein the second flow type is associated with a relatively high priority in a set of priorities, and wherein the first flow type is a best effort flow type.

27. (Original) The method of claim 1, wherein applying the one or more actions relative to the packet comprises shaping traffic of a particular flow to which the packet belongs represents by (a) delaying, at a current router, one or more particular packets that belong to the particular flow, and (b) sending the one or more particular packets out from the current router at a user-provisioned rate as long as the particular packets are within a burst tolerance defined for the particular flow.

28. (Original) The method of claim 1, wherein:

the flow comprises UDP traffic; and

determining the set of one or more user-specified policies comprises:

determining (a) whether a life duration of the flow is at least 10 seconds,

(b) whether an average bit rate associated with the flow is less than 100

Kbps, and (c) whether a packet size associated with the flow is less than

230 bytes; and

in response to determining that (a) the life duration of the flow is at least 10

seconds, (b) the average bit rate associated with the flow is less than 100 Kbps,

and (c) the packet size associated with the flow is less than 230 bytes, determining

that the flow represents Voice Over IP (VOIP) traffic; and

wherein applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with VOIP traffic in response to determining that the flow represents VOIP traffic.

29. (Original) The method of claim 1, wherein:

the flow comprises TCP traffic; and

determining the set of one or more user-specified policies comprises:

determining (a) whether a life duration of the flow is at least 10 seconds,  
(b) whether an average bit rate associated with the flow is greater than 32 Kbps, and (c) whether a packet size associated with the flow is greater than 1000 bytes; and

in response to determining that (a) the life duration of the flow is at least 10 seconds, (b) the average bit rate associated with the flow is greater than 32 Kbps, and (c) the packet size associated with the flow is greater than 1000 bytes, determining that the flow represents peer-to-peer (P2P) traffic; and wherein applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with P2P traffic in response to determining that the flow represents P2P traffic.

30. (Original) The method of claim 1, wherein:

the flow comprises UDP traffic; and

determining the set of one or more user-specified policies comprises:

determining (a) whether a life duration of the flow is at least 10 seconds, (b) whether an average bit rate associated with the flow is greater than 8 Kbps, (c) whether the average bit rate associated with the flow is less than 32 Kbps, (d) whether a packet size associated with the flow is greater than 100 bytes, and (e) whether the packet size associated with the flow is less than 500 bytes; and

in response to determining that (a) the life duration of the flow is at least 10 seconds, (b) the average bit rate associated with the flow is greater than 8 Kbps, (c) the average bit rate associated with the flow is less than 32 Kbps, (d) the packet size associated with the flow is greater than 100 bytes, and (e) the packet size associated with the flow is less than 500 bytes, determining that the flow represents online gaming traffic; and

wherein applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with online gaming traffic in response to determining that the flow represents online gaming traffic.

31. (Original) The method of claim 1, wherein:

determining the set of one or more user-specified policies comprises:

determining (a) whether a life duration of the flow is at least as great as a first threshold value, (b) whether an average bit rate associated with the flow is greater than a second threshold value, (c) whether the average bit rate associated with the flow is less than a third threshold value, (d) whether a packet size associated with the flow is greater than a fourth

threshold value, and (e) whether the packet size associated with the flow is less than a fifth threshold value; and

in response to determining that (a) the life duration of the flow is at least as great as the first threshold value, (b) the average bit rate associated with the flow is greater than the second threshold value, (c) the average bit rate associated with the flow is less than the third threshold value, (d) the packet size associated with the flow is greater than the fourth threshold value, and (e) the packet size associated with the flow is less than the fifth threshold value, determining that the flow represents online gaming traffic; and

wherein applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with online gaming traffic in response to determining that the flow represents online gaming traffic.



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11/497,002	07/31/2006	Surya K. Pappu	SABLE-01023	6030
43490 7590 03/05/2009 WEST & ASSOCIATES, A PC 2815 MITCHELL DRIVE SUITE 209 WALNUT CREEK, CA 94598			EXAMINER ZHOU, YONG	
			ART UNIT 2419	PAPER NUMBER
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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.

<b>Office Action Summary</b>	<b>Application No.</b> 11/497,002	<b>Applicant(s)</b> PAPPU ET AL.	
	<b>Examiner</b> Yong Zhou	<b>Art Unit</b> 2419	

-- 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 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 31 July 2006.
- 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) 1-31 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) 1- 31 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 31 July 2006 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) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. 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 –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5-9, 11, 13, 16, 17 and 21-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Maher, Robert Daniel III et al. (US 2003/0118029, hereinafter Maher).

**Regarding claim 1**, Maher teaches a machine-implemented method for processing a flow, the flow comprising a plurality of information packets ([0033], lines 7-12, wherein the traffic flow management for the stream of data packets is performed), and the method comprising:

maintaining a set of behavioral statistics for the flow at least in part by updating the set of behavioral statistics as information packets belonging to the flow are processed ([0022], lines 4-7, [0024], lines 22-29, [0031], lines 16-22, wherein the statistics and state awareness throughout all of the individual traffic flow can be stored);

determining a set of one or more user-specified policies that are satisfied by the set of behavioral statistics ([0008], lines 5-19, [0032], lines 1-9, wherein the policies are defined to enforce the terms of the service level agreements such as the resource allocation and particular service levels); and



applying, relative to a packet that belongs to the flow, one or more user-specified actions that are mapped to policies in the set of one or more user-specified policies ([0008], lines 19-27, [0059], lines 1-10, wherein once the subscriber and type of traffic have been identified, the policies for that subscriber can be enforced. A treatment for each data packet is determined based on the scanning and preprogrammed policies).

**Regarding claim 2,** Maher further teaches that:

determining the set of one or more user-specified policies comprises determining, based on the set of behavioral characteristics, whether the flow represents a particular type of traffic that has characteristics that are expressed by parameters that are indicated within the one or more user-specified policies ([0008], lines 14-17, [0032], lines 6-9);

applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with the particular type of traffic ([0008], lines 17-19, [0032], lines 3-9).

**Regarding claim 3,** Maher further teaches that:

determining the set of one or more user-specified policies comprises determining, based on the set of behavioral characteristics, whether the flow represents Voice Over IP (VOIP) traffic ([0024], lines 22-29); and

applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with VOIP traffic ([0034], lines 8-13).

**Regarding claim 5**, Maher further teaches that applying the one or more actions relative to the packet comprises changing a quality of service indicator that is associated with a flow to which the packet belongs, wherein an immediacy with which a routing device forwards the packet is based at least in part on the quality of service indicator ([0008], lines 19-27, ([0034], lines 8-13).

**Regarding claim 6**, Maher further teaches that changing the quality of service indicator comprises changing a flow type of the flow from a first flow type to a second flow type that differs from the first flow type, wherein at least one flow type of the first and second flow types indicates to a router that packets that belong to a flow that is associated with said at least one flow type need to be forwarded at no less than 6 a specified rate ([0009], lines 3-11).

**Regarding claim 7**, Maher further teaches that changing the quality of service indicator comprises changing a priority of the flow from a first priority to a second priority that differs from the first priority, wherein the priority of the flow indicates to a router an extent to which packets that belong to the flow should be dropped when the router needs to drop one or more packets ([0021], lines 11-15).

**Regarding claim 8**, Maher further teaches that applying the one or more actions relative to the packet comprises logging information about the packet ([0008], lines 16-19).

**Regarding claim 9**, Maher further teaches that applying the one or more actions relative to the packet comprises re-routing the packet by forwarding the packet through

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an egress that is separate from an egress that is associated with a destination that the packet specifies ([0051], lines 17-20).

**Regarding claim 11**, Maher further teaches that applying the one or more actions relative to the packet comprises changing contents of the packet prior to forwarding the packet ([0038], lines 1-10).

**Regarding claim 13**, Maher further teaches that maintaining the set of behavioral statistics for the flow comprises updating an average packet rate indicator that indicates an average rate at which packets belonging to the flow have been processed at a router ([0009], lines 3-11, [0055], lines 1-6).

**Regarding claim 16**, Maher further teaches that applying the one or more actions relative to the packet comprises changing an aggregate class to which the flow belongs from a first aggregate class to a second aggregate class that is separate from the first aggregate class ([0009], lines 3-11, [0053], lines 3-7).

**Regarding claim 17**, Maher further teaches that applying the one or more actions relative to the packet comprises changing a maximum allowable bandwidth associated with the flow from a first bandwidth to a second bandwidth that is different from the first bandwidth ([0024], lines 22-29, [0032], lines 1-9).

**Regarding claims 21-24**, Maher further teaches changing a flow type from type 1 at one rate (or best effort) to type 2 at 2<sup>nd</sup> rate (or best effort) ([0057], lines 1-8).

**Regarding claims 25 and 26**, Maher further teaches changing a flow type from type 1 at relatively high priority (or best effort) to type 2 at best effort (or relatively high priority) ([0021], lines 11-15, [0057], lines 1-8).

**Regarding claim 27**, Maher further teaches that applying the one or more actions relative to the packet comprises shaping traffic of a particular flow to which the packet belongs represents by (a) delaying, at a current router, one or more particular packets that belong to the particular flow, and (b) sending the one or more particular packets out from the current router at a user-provisioned rate as long as the particular packets are within a burst tolerance defined for the particular flow ([0033], lines 7-12).

***Claim Rejections - 35 USC § 103***

3. 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 negated by the manner in which the invention was made.

4. Claims 4 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Luong, Steven V. (US 6,314,105, hereinafter Luong).

**Regarding claims 4 and 20**, Maher teaches the limitations of claim 1 but fails to teach comparing the particular behavioral statistic with a minimum value and a maximum value.

Luong teaches comparing bit rate with two predetermined thresholds and the second threshold is significantly lower than the first threshold (Fig. 3, col. 3, lines 64-66).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Luong into the Maher

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invention to include comparison of the value range of the behavioral statistic with min and max thresholds. This combination would produce predictable results.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Sahaya, Anurag et al. (US 2003/0058874, hereinafter Sahaya).

**Regarding claim 10**, Maher further teaches forwarding the packet through an egress that is separate from an egress that is associated with a destination that the packet specifies ([0051], lines 17-20).

Maher does not specifically teach making and forwarding a copy of the packet.

Sahaya teaches that smart GGSN interface may retain the signaling packet and send a copy of the signaling packet to the proxy ([0084], lines 6-8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Sahaya into the Maher invention to make and forward a copy of the packet. This combination would produce predictable results.

6. Claims 12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Konuma, Ryohei (US 2002/0141339, hereinafter Konuma).

**Regarding claim 12**, Maher teaches the limitations of claim 11 but fails to teach changing contents of a Diffserv Code Point (DSCP) field of an Internet Protocol (IP) header of the packet prior to forwarding the packet.

Konuma teaches that the individual flow detection information may be, for example, an IP layer source address, an IP layer destination address, type-of-service (TOS) information, differentiated services codepoint (DSCP) information, or other information enabling packets to be identified as belonging to a specific individual flow ([0036], lines 10-15).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Konuma into the Maher invention to allocate DSCP value for supporting required quality of service profiles. This combination would produce predictable results.

**Regarding claim 18**, Maher further teaches that:

determining the set of one or more user-specified policies comprises:

determining an average bit rate and a packet size associated with the flow ([0057], lines 1-8, [0058], lines 10-14); and

in response to the determination, determining that the flow represents Voice over IP (VOIP) traffic ([0008], lines 14-17, [0024], lines 22-29).

However, Maher does not specifically teach comparing flow duration, data rate and packet size to appropriate thresholds for determining flow type.

Konuma teaches that the priority of an individual flow tends to increase or decrease depending on whether its data rate, as measured in bytes per unit time, is less than or greater than the preset value. Flows of sufficient long duration therefore tend to receive either high or low priority, depending both on the rate of packet arrival and the average packet length ([0070], lines 1-7).

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Konuma into the Maher invention to compare flow duration, packet rate and size with appropriate threshold in order to determine the flow type such as VoIP. This combination would produce predictable results.

7. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Luft, Siegfried Johannes et al. (US 20060233101, hereinafter Luft).

**Regarding claims 14 and 15**, Maher teaches the limitations of claim 1 but fails to teach updating an average inter-packet gap indicator that indicates an average interval of time that has passed between times at which packets belonging to the flow have arrived at a router

Luft teaches the packet transmission gap or inter-packet gap ([0008], lines 10-13, [0045], lines 7-12).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Luft into the Maher invention to update inter-packet gap. This combination would produce predictable results.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Yonge, Lawrence W. III et al. (US 2004/0136396, hereinafter Yonge).

**Regarding claim 19**, Maher further teaches that:

determining the set of one or more user-specified policies comprises determining, based on the set of behavioral characteristics, whether the flow represents real time or non-real time traffic ([0009], lines 3-6); and

applying the one or more user-specified actions comprises applying, relative to the packet, one or more actions that are associated with the real time or non-real time traffic ([0009], lines 6-11).

However, Maher does not specifically teach online gaming.

Yonge teaches traffic classification with typical parameter values for applications such as gaming, video, VoIP etc. (Table 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Yonge into the Maher invention to specifically include online gaming services. This combination would produce predictable results.

9. Claim 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Konuma, Yonge and Kwon, Ohsuk D. (US 2007/0133524, hereinafter Kwon).

**Regarding claim 28**, Maher teaches the limitations of claim 1. It contains similar limitations as claim 18 except for UDP packets contained in the flow and specific threshold values for the traffic parameter comparison.



Yonge teaches traffic classification with typical parameter values for applications such as gaming, video, VoIP etc.; for example, for VoIP, the bit rate is less than 64 kbps and packet length is less than 500 octets (Table 1).

Kwon teaches that the VoIP client may employ UDP ([0021], lines 14-19) and that VoIP flow duration may be 10-60 seconds ([0045], lines 3-5, [0056], lines 8-10).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Yonge and Kwon into the Maher- Konuma invention to include UDP packets in the flow and specific threshold values for the traffic parameter comparison. This combination would produce predictable results.

**Regarding claim 29**, Maher teaches the limitations of claim 1. It contains similar limitations as claim 28 except for TCP packets contained in the flow and peer-to-peer traffic.

Yonge further teaches peer-to-peer traffic ([0034], lines 10-13).

Kwon further teaches that the client may employ TCP ([0021], lines 14-19).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further combine teachings from Yonge and Kwon into the Maher- Konuma- Yonge-Kwon invention to include TCP packets in the flow and peer-to-peer traffic. This combination would produce predictable results.

**Regarding claim 30**, Maher teaches the limitations of claim 1. It contains similar limitations as claim 28 except for gaming traffic as taught by Yonge. Therefore, it is rejected for the same reasons.

10. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher in view of Konuma and Yonge.

**Regarding claim 31**, Maher teaches the limitations of claim 1. It contains similar limitations as claim 18 except for online gaming traffic.

Yonge teaches traffic classification with typical parameter values for applications such as gaming, video, VoIP etc. (Table 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine teachings from Yonge into the Maher-Konuma invention to specifically include online gaming services. This combination would produce predictable results.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yong Zhou whose telephone number is 571-270-3451. The examiner can normally be reached on Monday - Friday 8:00am - 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chirag G. Shah can be reached on 571-272-3144. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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February 27, 2009

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