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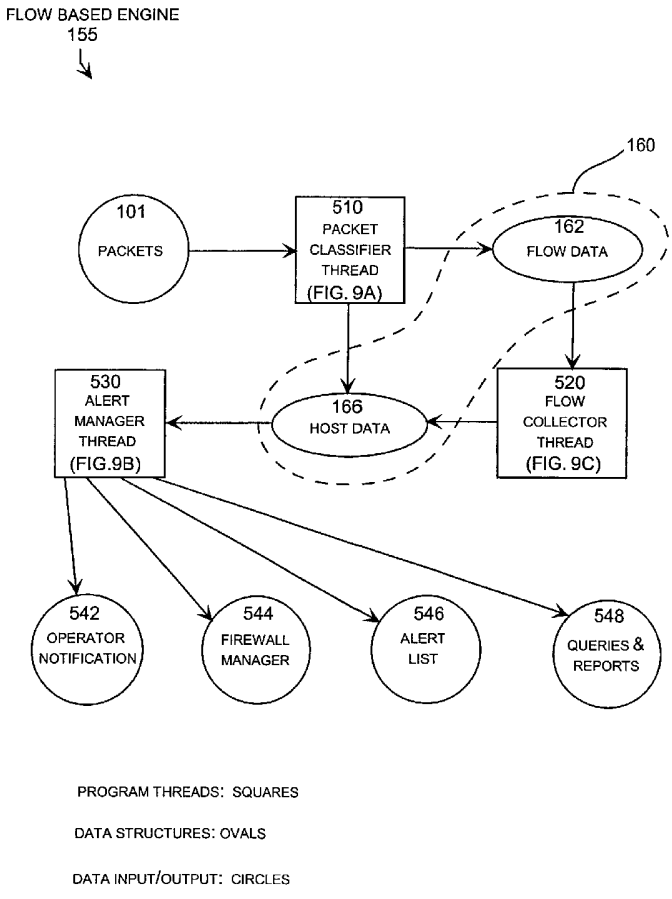
(54) Title: FLOW-BASED DETECTION OF NETWORK INTRUSIONS



(57) Abstract: A flow-based intrusion detection system for detecting intrusions in computer communication networks. Data packets representing communications between hosts in a computer-to-computer communication network are processed and assigned to various client/server flows. Statistics are collected for each flow. Then, the flow statistics are analyzed to determine if the flow appears to be legitimate traffic or possible suspicious activity. A concern index value is assigned to each flow that appears suspicious. By assigning a value to each flow that appears suspicious and adding that value to the total concern index of the responsible host, it is possible to identify hosts that are engaged in intrusion activity. When the concern index value of a host exceeds a preset alarm value, an alert is issued and appropriate action can be taken.

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European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

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PCT/US 01/45275

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L29/06 G06F1/00

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L G06F

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 34847 A (DIEP THANH A ;VISA INT SERVICE ASS (US)) 15 June 2000 (2000-06-15)	1-11
A	abstract; figures 3-9	12
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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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

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

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

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 June 2002	10/07/2002

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Köppl, M

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International Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	KATO N ET AL: "A REAL-TIME INTRUSION DETECTION SYSTEM (IDS) FOR LARGE SCALE NETWORKS AND ITS EVALUATIONS" IEICE TRANSACTIONS ON COMMUNICATIONS, INSTITUTE OF ELECTRONICS INFORMATION AND COMM. ENG. TOKYO, JP, vol. E82-B, no. 11, November 1999 (1999-11), pages 1817-1825, XP001063764 ISSN: 0916-8516 Sections 3. "The Real-Time IDS and Its Implementation" and 4. "Evaluation of the Proposed System" page 1819, right-hand column -page 1823, right-hand column	1-12
Y	DEBAR H ET AL: "Towards a taxonomy of intrusion-detection systems" COMPUTER NETWORKS, ELSEVIER SCIENCE PUBLISHERS B.V., AMSTERDAM, NL, vol. 31, no. 8, 23 April 1999 (1999-04-23), pages 805-822, XP004304519 ISSN: 1389-1286 Section 3.1.2. "Behaviour-based intrusion detection" page 810, left-hand column -page 811, right-hand column	1-12
P,X	US 6 321 338 B1 (VALDES ALFONSO ET AL) 20 November 2001 (2001-11-20) cited in the application	1-11
A	column 6, line 59 -column 8, line 30 column 11, line 57 -column 12, line 6	12
P,X	WO 01 31420 A (VISA INTERNAT SERVICE ASS) 3 May 2001 (2001-05-03) abstract	1-11

INTERNATIONAL SEARCH REPORT

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WO 0034847 A	15-06-2000	US 6370648 B1	09-04-2002
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