(19) World Intellectual Property Organization International Bureau



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(43) International Publication Date 4 January 2001 (04.01.2001)

PCT

(10) International Publication Number WO 01/01272 A3

(51) International Patent Classification⁷: G06F 15/173

(21) International Application Number: PCT/US00/18330

(22) International Filing Date: 30 June 2000 (30.06.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 60/141,903 30 June 1999 (30.06.1999) Us

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- (81) Designated States (national): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

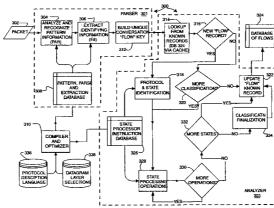
Published:

with international search report

(88) Date of publication of the international search report: 7 September 2001

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR MONITORING TRAFFIC IN A NETWORK



(57) Abstract: A monitor for and a method of examining packets passing through a connection point on a computer network. Each packet conforms to one or more protocols. The system [100] has a computer network [102] that communicates packets between various clients [104-107] and servers [110] and [112]. The method includes a network packet monitor [300] receiving a packet [302] from a packet acquisition device [123] and performing one or more parsing/extraction operations on the packet to create a parser record comprising a function of selected portions of the packet. The parsing/extraction operations depend on one or more protocols to which the packet conforms. The method further includes looking up a flow-entry database [324] containing flow-entries for previously encountered conversational flows. The lookup uses the selected packet portions and determining if the packet is of an extensing flow. If the packet is of an existing flow, the method classifies the packet as belonging to the found existing flow, and if the packet is of a new clow, the method stores a new flow-entry for the new flow in the flow-entry database, including identifying information for future packets to be identified with the new flow-entry. The method thus examines each and every packet passing through the connection point in real time until the application program associated with the conversational flow is determined.



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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A. CLASSIFICATION OF SUBJECT MATTER IPC(7) :G06F 15/173 US CL :709/223, 224				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED	11			
Minimum documentation searched (classification system followed by classification symbols) U.S.: 709/223, 224				
Documentation searched other than minimum documentation to the	ne extent that such documents are included	in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)				
EAST, INTERNET search terms: packet, examine, analysis, analyze, monitor, cam, comparator, parser, table, lookup, flow, database				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category* Citation of document, with indication, where a	ppropriate, of the relevant passages	Relevant to claim No.		
Y US 5,917,821 A (GOBUYAN et al), COL. 1, LINES 45-67, COL. 4, LINI 67, COL. 22, LINES 15-17		1-3, 6-40, 45-59, 94-100, 119-124		
LINES 38-68, COL. 2, LINES 1-68, 5, LINES 30-59, COL. 7, LINES 5 COL. 9, LINES 1-65, COL. 11, LINI	US 5,414,704 A (SPINNEY) 09 MAY 1995, ABSTRACT, COL. 1, LINES 38-68, COL. 2, LINES 1-68, COL. 3, LINES 1-53, COL. 5, LINES 30-59, COL. 7, LINES 5-57, COL. 8, LINES 51-68, COL. 9, LINES 1-65, COL. 11, LINES 38-68, COL. 12, LINES 1-22, COL. 13, LINES 31-68, COL. 14, LINES 1-68, COL. 15, LINES 1-68, COL. 16, LINES 1-68.			
A, P US 6,014,380 A (HENDEL et al) 1 LINES 65-67, COL. 4, LINES 1-50,		1		
X Further documents are listed in the continuation of Box C	See patent family annex.			
* Special categories of cited documents: "T" later document published after the international filing date or priority				
"A" document defining the general state of the art which is not considered to be of particular relevance	date and not in conflict with the applica principle or theory underlying the inve			
"E" earlier document published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step			
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	when the document is taken alone	-		
"O" document referring to an oral disclosure, use, exhibition or other means	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art			
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent	family		
Date of the actual completion of the international search 21 FEBRUARY 2001	Date of mailing of the international search report 28 MAR 2001			
Name and mailing address of the ISA/US	Authorized officer			
Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 MARK RINEHAR James R. Matturation		Mattheway		
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International application No. PCT/US00/18330

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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.	
A	US 5,511,215 A (TERASAKA et al) 23 APRIL 1996, ABSTRACT, COL. 4, LINES 15-60, COL. 6, LINES	3-20	1	
Y	US 5,351,243 A (KALKUNTE et al) 27 SEPTEMBER ABSTRACT, FIGURES 3, 4, COL. 1, LINES 36-65, LINES 14-23, COL. 3, LINES 1-68, COL. 4, LINES 5, LINES 20-68, COL. 6, LINES 1-68, COL. 7, LINE COL. 8, LINES 48-68, COL. 9, LINES 1-68, COL. 2 15-68, COL. 26, LINES 1-65	COL. 2, 1-68, COL. ES 3-19,	1-22, 24-59, 94- 104, 119-124	
Y	US 5,787,253 A (MCCREERY et al) 28 JULY 1998, ABSTRACT, FIGURES 2, 4A-4D, 8-11, COL. 2, LINES 8-67, COL. 4, LINES 3-67		1-5, 9-34, 36-42, 46-59, 94-98, 119-123	
A	US 5,247,517 A (ROSS et al) 21 SEPTEMBER 1993, ABSTRACT,		1	
Y	US 5,315,580 A (PHAAL) 24 MAY 1994, ABSTRAC LINES 60-68, COL. 2, LINES 1-68, COL. 3, LINES COL. 4, LINES 1-65, COL. 6, LINES 28-61	T, COL. 1, 33-68,	1	

International application No. PCT/US00/18330

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)		
This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:		
1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:		
2. Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:		
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).		
Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)		
This International Searching Authority found multiple inventions in this international application, as follows:		
Please See Extra Sheet.		
1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.		
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.		
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:		
4. X No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-59, 94-104 and 119-124		
Remark on Protest The additional search fees were accompanied by the applicant's protest. No protest accompanied the payment of additional search fees.		

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BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claim(s)1-59,94-104, AND 119-124, drawn to signatures, packet monitoring and parsing.

Group II, claim(s) 60-77, drawn to performing protocol specific operations and compression.

Group III, claim(s) 78-93, drawn to analyzing packets and quality of service.

Group IV, claim(s) 105-118, drawn to a cache system.

Group V, claim(s)125-128, drawn to a processor.

Group VI, claim(s)129-144, drawn to searching and a comparator.

The inventions listed as Groups I, II, III, IV, V, and VI do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The inventive groups are drawn towards divergent, distinctly different inventions. Technical features for Group I, are for signatures, packet monitoring and parsing. While the technical features of Group II, are for performing protocol specific operations and compression. While the technical features for Group III, are for to analyzing packets and quality of service. While the technical features for Group IV, are for a cache system. While the technical features for V, are for to a processor. While the technical features for Group VI, are for. searching and a comparator.