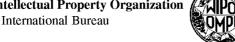
(19) World Intellectual Property Organization





(43) International Publication Date 11 August 2005 (11.08.2005)

(51) International Patent Classification: G06F 15/16 (2006.01)

(21) International Application Number:

PCT/US2005/001253

(22) International Filing Date: 14 January 2005 (14.01.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

10/759,182 20 January 2004 (20.01.2004) US

(71) Applicant (for all designated States except US): CISCO TECHNOLOGY, INC. [US/US]; 170 West Tasman Drive, San Jose, CA 95134-1706 (US).

(72) Inventors; and

- (75) Inventors/Applicants (for US only): DUFFIE, John, Brawner, III [US/US]; 105 Java Court, Cary, NC 27519 (US). HANNOCK, Theodore, Michael [US/US]; 1928 Baronsmede Drive, Raleigh, NC 27615 (US). OCHMAN-SKI, Steven, Robert [US/US]; 5216 Cottage Oaks Lane, Raleigh, NC 27616 (US).
- (74) Agent: TURKEVICH, Leon, R.; 2000 M Street, N.W., Suite 700, Washington, DC 20036-3307 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

(10) International Publication Number WO 2005/072143 A3

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, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:

8 June 2006

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.

(54) Title: ARRANGEMENT IN AN IP NODE FOR PRESERVING SECURITY-BASED SEQUENCES BY ORDERING IP PACKETS ACCORDING TO QUALITY OF SERVICE REQUIREMENTS PRIOR TO ENCRYPTION

(57) Abstract: A router has at least one outbound interface configured for establishing multiple IP-based secure connections (i.e., tunnels) with respective destinations based on transmission of encrypted data packets via the IP-based secure connections. The encrypted data packets are generated by a cryptographic module, where each encrypted packet successively output from the cryptographic module includes a corresponding successively-unique sequence number. The supply of data packets to the cryptographic module is controlled by a queue controller: the queue controller assigns, for each secure connection, a corresponding queuing module configured for outputting a group of data packets associated with the corresponding secure connection according to a corresponding assigned maximum output bandwidth. Each queuing module also is configured for reordering the corresponding group of data packets according to a determined quality of service policy and the corresponding assigned maximum output bandwidth.

WO 2005/072143

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/01253

A. CLASSIFICATION OF SUBJECT MATTER IPC: G06F 15/16(2006.01)			
- -	•		
USPC: 709/232 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) U.S.: 709/232			
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched			
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)			
C. DOC	UMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where a	ppropriate, of the relevant passages	Relevant to claim No.
X	US 2003/0093563 A1 (YOUNG et al) 15 May 2003 (15.05.2003), see entire document.		1-35
Further	documents are listed in the continuation of Box C.	See patent family annex.	
Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance		"T" later document published after the inte	rnational 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	
	plication or patent published on or after the international filing date	when the document is taken alone	ted to illyotye an illyentive 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) "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	
Date of the actual completion of the international search		Date of mailing of the international search report	
02 April 2006 (02.04.2006)		Authorized officer	
Name and mailing address of the ISA/US		Valerie Bell-Harris for William Dixon	
Mail Stop PCT, Attn: ISA/US Commissioner for Patents			
P.O. Box 1450 Alexandria, Virginia 22313-1450		Telephone No. (571) 272-1600	•
Facsimile No. (571) 273-3201			