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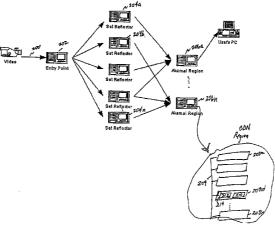
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(54) Title: STREAMING MEDIA SUBSCRIPTION MECHANISM FOR A CONTENT DELIVERY NETWORK



(57) Abstract: A reflector network is used within a content delivery network to enable requesting end users to subscribe to live streams that have been published to CDN entry points. A reflector is a generalized packet router program. The reflector network preferably comprises a hierarchy of reflectors that are located at the various entry points into the CDN, at each edge node at which requesting users may be directed by the CDN to obtain live streams, and at various "reflector" nodes located within at least one intermediate layer (in the hierarchy) between the entry points and the edge nodes. The edge nodes and each reflector node also include a manager program that arranges for feeds. When an end user is directed to an edge node that is not yet receiving the desired stream, the edge node's manager issues a subscription request to a set of reflector nodes. If the reflector node(s) are already receiving the desired stream, their reflector(s) begin sending it to the requesting edge node. If, however, the reflector node(s) are not already receiving the desired stream, their manager programs issue the subscription request to the entry point(s) to start the feed.



INTERNATIONAL SEARCH REPORT

Int ional Application No PCT/US 01/50144

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H04L29/06 H04L29/12

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

B. FIELDS SEARCHED

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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT					
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.			
Α	US 6 006 264 A (NAIR RAJ KRISHNAN ET AL) 21 December 1999 (1999-12-21) abstract column 6, line 64 -column 10, line 39	1-9			
A	WO 99 40514 A (BALTER JAMES A ;FARBER DAVID A (US); GREER RICHARD E (US); SWART A) 12 August 1999 (1999-08-12) abstract page 4, line 8 -page 5, line 24 page 12, line 16 -page 16, line 21 page 19, line 19 -page 23, line 27	1-9			

Further documents are listed in the continuation of box C.	Patent family members are listed in annex.		
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "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 "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 '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. '&' document member of the same patent family 		
Date of the actual completion of the international search 9 October 2002	Date of malling of the international search report 16/10/2002		
Name and mailing address of the ISA 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	Authorized officer Stergiou, C		

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PCT/US 01/50144

ategory °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	US 6 108 703 A (LEWIN DANIEL M ET AL) 22 August 2000 (2000-08-22) abstract	1-9
	column 2, line 31 -column 3, line 16 column 7, line 37 -column 8, line 19 column 9, line 20 -column 10, line 18	

INTERNATIONAL SEARCH REPORT

→ information on patent family members

Int ional Application No PCT/US 01/50144

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 6006264	Α	21-12-1999	AU	8373298 A	22-02-1999
			WO US	9906913 A1 6449647 B1	11-02-1999 10-09-2002
WO 9940514		12-08-1999	US	6185598 B1	06-02-2001
			ΑU	2652999 A	23-08-1999
			CA	2320261 A1	12-08-1999
			EP	1143337 A1	10-10-2001
			EΡ	1053524 A1	22-11-2000
			JP	2002503001 T	29-01-2002
			NO	20004010 A	10-10-2000
			US	2002049857 A1	25-04-2002
			US	2002099850 A1	25-07-2002
			MO	9940514 A1	12-08-1999
			US 	2001056500 A1	27-12-2001
US 6108703	Α	22-08-2000	AU	4995299 A	07-02-2000
			BR	9912001 A	04-12-2001
			CN	1312923 T	12-09-2001
			DE	1125219 T1	23-05-2002
			EΡ	1125219 A1	22-08-2001
			JP	2002520735 T	09-07-2002
			WO	0004458 A1	27-01-2000
			US	2002099850 A1	25-07-2002