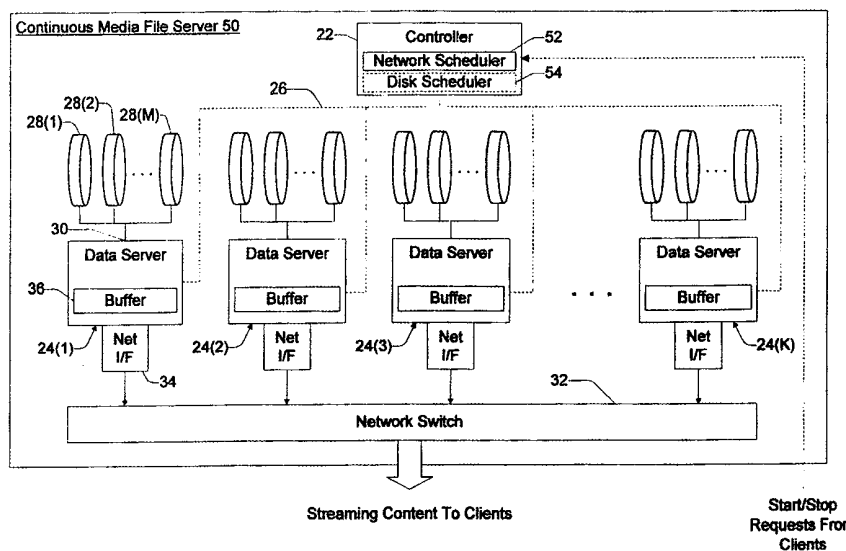




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<p>(21) International Application Number: PCT/US98/18865 (22) International Filing Date: 10 September 1998 (10.09.98) (30) Priority Data: 08/934,972 18 September 1997 (18.09.97) US (71) Applicant: MICROSOFT CORPORATION [US/US]; One Microsoft Way, Redmond, WA 98052-6399 (US). (72) Inventors: BOLOSKY, William, J.; 24622 S.E. Mirromont Drive, Issaquah, WA 98027 (US). DOUCEUR, John, R.; 14711 N.E. 50th Place, Unite J-2, Bellevue, WA 98007 (US). (74) Agents: LEE, Lewis, C. et al.; Suite 430, W. 201 North River Drive, Spokane, WA 99201 (US).</p>		<p>(81) Designated States: CA, CN, JP, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 20 May 1999 (20.05.99)</p>

(54) Title: CONTINUOUS MEDIA FILE SERVER AND METHOD FOR SCHEDULING NETWORK RESOURCES



(57) Abstract

A continuous media file server system has a controller connected to multiple data servers. Each data server supports at least one storage disk. Data files are distributed across the data server so that data blocks of the data files are stored on each of the storage disks. The data files have different data transmission rates at which they are served over a network to clients in the form of data streams. A scheduling unit maintains a network schedule that provides a relative ordering of transmission times of requested data streams. The transmission times indicate when the data servers are to transmit corresponding data blocks of the requested data files over the network to stream the data to clients. The block play times for all data files have a fixed duration, with the size of the data blocks from data file to data file varying according to the data transmission rates of the files. When a transmission time for a data file block approaches, the scheduling unit instructs the appropriate data server to read a data block for that data file from the disk prior to the transmission time in the network schedule. In this manner, disk reads are scheduled implicitly according to the network schedule. The data is temporarily stored in buffer memory, and later transmitted over the network. When a request for a new data stream is received, the scheduling unit evaluates whether the new data stream can be inserted into the network schedule without overburdening the data servers' ability to serve the existing data streams on the network schedule.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/18865

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 H04L29/06

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 6 H04L

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>KUMAR M ET AL: "A HIGH PERFORMANCE VIDEO SERVER FOR BROADBAND NETWORK ENVIRONMENT" PROCEEDINGS OF THE SPIE, vol. 2667, 29 January 1996, pages 410-421, XP000675452</p> <p>see abstract see page 411, line 40 - page 412, line 7 see figure 1 see page 413, line 34 - line 52 see page 415, line 7 - line 8 see page 417, line 26 - line 30 see page 419, line 25 - line 30</p> <p style="text-align: center;">---</p> <p style="text-align: center;">-/--</p>	<p>1-3, 5, 10-13, 18, 23, 24, 26-28, 33-35, 50-52, 64, 65, 67, 68</p>

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

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.
A	<p>EP 0 695 062 A (MICROSOFT CORP) 31 January 1996 see abstract see page 2, column 1, line 29 - column 2, line 30 see page 3, column 3, line 6 - line 8 see page 3, column 3, line 14 - line 17 see page 3, column 3, line 38 - line 45 see page 3, column 3, line 58 - column 4, line 41 see page 5, column 7, line 29 - column 8, line 44 see claims 2-4</p>	1-70
A	<p>WO 97 25817 A (GRAF MARCEL ;IBM (US)) 17 July 1997 see abstract see page 1, line 23 - line 30 see page 7, line 17 - line 20</p>	1-70

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/18865

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EP 0695062 A	31-01-1996	US 5583868 A JP 8107422 A	10-12-1996 23-04-1996
WO 9725817 A	17-07-1997	EP 0878097 A JP 10507056 T	18-11-1998 07-07-1998