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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 C.F.R. 1.53(c)

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[X] Additional inventors are being named on the separately numbered sheet(s) attached hereto

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TITLE OF THE INVENTION (280 characters max)

Synchronization of Bulk Data Transfers to End Node Devices in a Multimedia Network

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ENCLOSED APPLICATION PARTS *(check all that apply)*

[X] Specification *Number of Pages* [35] [ ] Other (specify) _____

[X] Drawing(s) *Number of Sheets* [14] _____

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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

[X] No

[ ] Yes, the name of the U.S. Government agency and the Government contract number are: _____

Signature		Date	November 28, 2000
Submitted by Typed or Printed Name	David J. Thibodeau, Jr.	Reg. Number	31,671

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Additional Page

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SYNCHRONIZATION OF BULK DATA TRANSFERS TO END NODE DEVICES IN A MULTIMEDIA NETWORK

BACKGROUND OF THE INVENTION

At the present time, most data network devices located in the residences include some type of personal computer. Typically, these personal computers are used to connect to Internet Service Providers over dial-up connections to execute application programs such as email clients and Web browsers that utilize the global Internet to access text and graphic content. Increasingly, the demand is for multimedia content, including audio and video, to be delivered over such networks. However, the backbone architectures of purely data networks, especially those designed for use with the telephone network, were not originally designed to handle such high data rates.

The trend is towards a more ubiquitous model where the network devices in the home will be embedded systems designed for a particular function or purpose. This has already occurred to some degree. Today, for example, cable television (CATV) network set-top boxes typically have limited data communication capabilities. The main function of the data devices is to handle channel access between residential users and a head end or server on the cable TV network.

However, it is estimated that the worldwide market for Internet appliances such as digital set-top boxes and Web-connected terminals will reach $17.8 billion in 2004, and millions of such digital set-top boxes have already been deployed. Increasingly, advertisers and content providers view the cable set-top as the first platform of choice

for widespread delivery of a suite of intelligent content management and distribution services.

In the future, the functionality offered by these set-top boxes or other embedded platforms, such as a game system, will be expanded. For example, they may offer Internet browsing capabilities and e-commerce serving capabilities. Moreover, it is anticipated that common-household appliances will also have network functionality, in which they will be attached to the network to automate various tasks.

SUMMARY OF THE INVENTION

Because of their extremely large number of network devices in such networks, efficient distribution and delivery of promotions and other digital content remains a challenge. Where the personal computer can be updated with new network drivers as the network evolves, embedded client systems remain relatively static. In addition, such networks may have hundreds of thousands, if not millions, of network devices to manage. It is evident that standard data Open Systems Inerconnection (OSI) layered network protocols, which were optimized for peer to peer communication, are not an entirely acceptable arrangement.

Consider that the digital set top box provides certain interesting functionalities, such as the ability to store certain amounts of data. The set top box can thus be designed to store a multimedia computer file which represents a digitized version of the promotion. However, such a network may have hundreds of thousands, if not millions of set top boxes, to which delivery of promotions must be individually coordinated. If such a data network were built using only the standard protocols such as direct TCP/IP messaging from a central promotion server to the set top boxes, the sheer volume of message traffic needed to route the promotions to the intended destinations would quickly overload the central data server.

The present invention involves a technique for synchronization of bulk data transfers to end node devices in a multimedia network in which an initial schedule message is sent prior to broadcast or multicast of a content file. The content file could

be a promotion or other file that must be efficiently sent to a large number of end node devices, such as television set top boxes. The schedule message contains at least an data transmission time for the content file so that an end node device is aware of when to listen for the later bulk data transmission of the content file. The schedule message may contain other parameters such as promotion identification, message duration, frequency, multicast address and UDP port.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram illustrating a multimedia content delivery system for distributing content such as targeted promotions according to one embodiment of the present invention.

FIG. 2 is a diagram of a set top box/video display system displaying active promotions according to one embodiment.

FIG. 3A is a diagram illustrating a set of packages according to one embodiment.

FIG. 3B is a table containing typical data transmission parameters specified by a package according to one embodiment.

FIG. 3C is a table containing parameters specified by a transmission group according to one embodiment.

FIG. 3D is a flow diagram illustrating a process for packaging promotions for transmission groups according to one embodiment.

FIG. 3E is a diagram illustrating one way in which devices may be mapped from their a promotion group into transmission groups.

FIG. 4A is a time line diagram illustrating a promotion transmission lead-time with its constituent lead-times according to one embodiment.

FIG. 4B is a time line diagram illustrating a schedule transmission lead-time according to one embodiment.

FIG. 5 is a state line diagram illustrating a process for synchronizing the delivery of promotions to end node devices according to one embodiment.

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