

Decentralized Media Delivery

Abstract

A method to provide video on demand solving the problem of prohibitive bandwidth requirements for content provider, and solving billing, copy, and trademark concerns of distributed media. The bandwidth requirements are shifted away from the content provider to the subscriber network. A media file is partitioned into small segments, and then distributed in pieces to subscribers' hard drives. A request is sent to the main server for a specific media offering by a subscriber. The main server sends out a message to all subscribers to send any part of the media that is stored on their system directly to the subscriber who is requesting the media. When the requesting subscriber has received all parts of the movie, a message is sent to the main server requesting the encryption key to unlock the movie. An additional benefit of the act of sending the media in pieces to many different locations provides a high level of security and deterrence to piracy. No single location has more than a small segment of a media file that by itself would be useless to potential wrong doers.

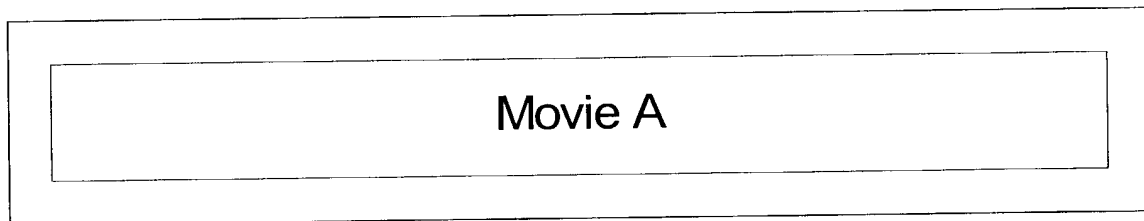


Figure 1

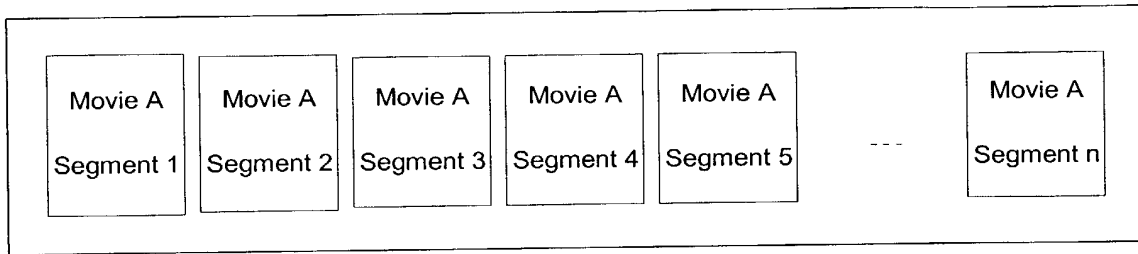


Figure 2

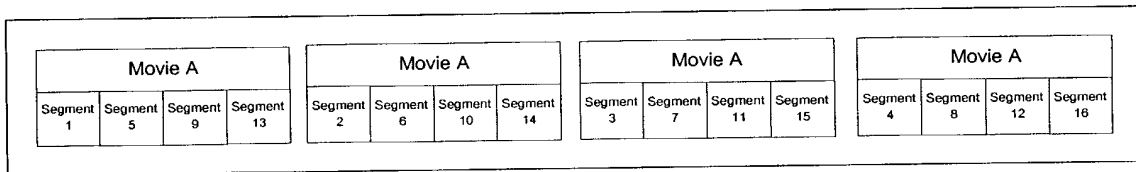


Figure 3

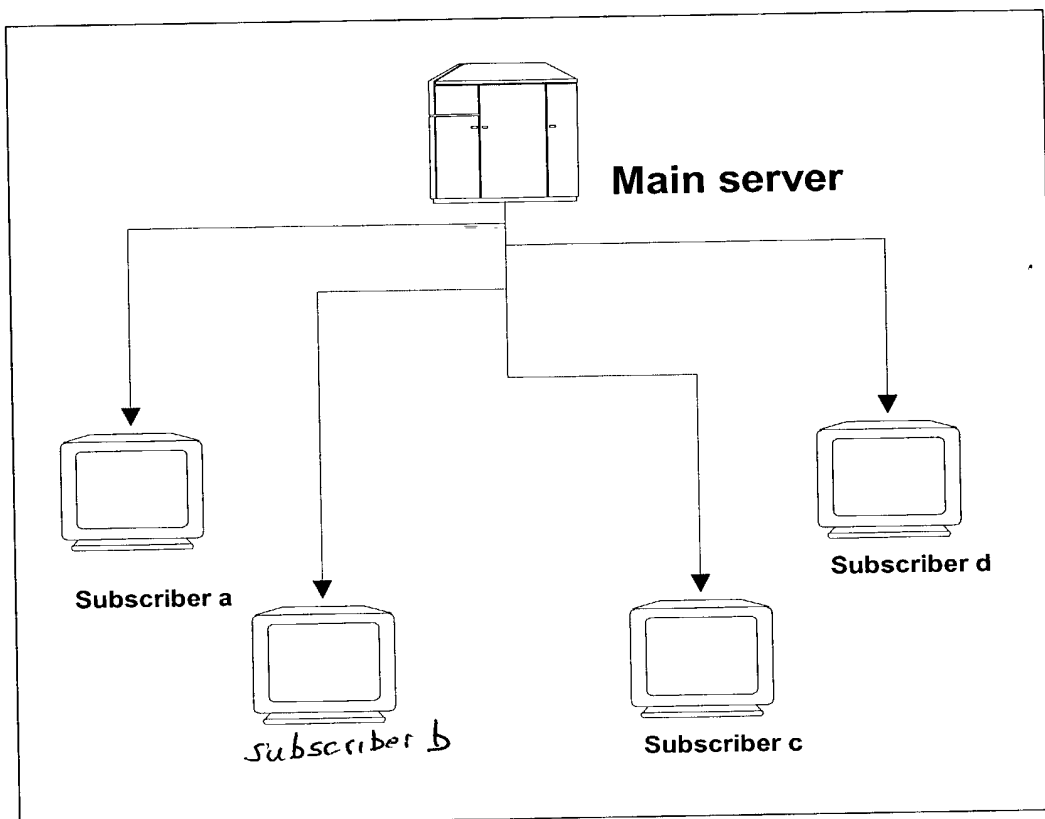


Figure 4

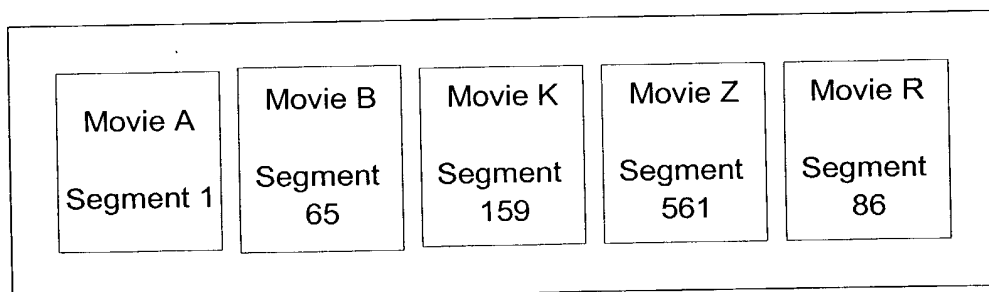


Figure 5

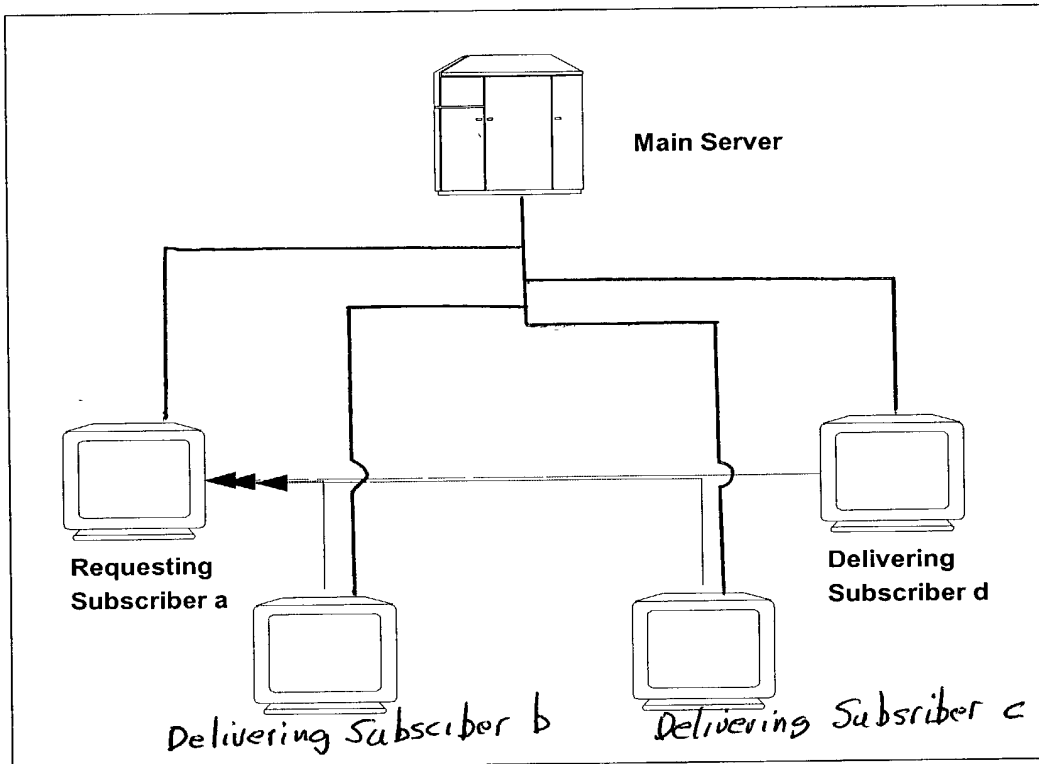


Figure 6

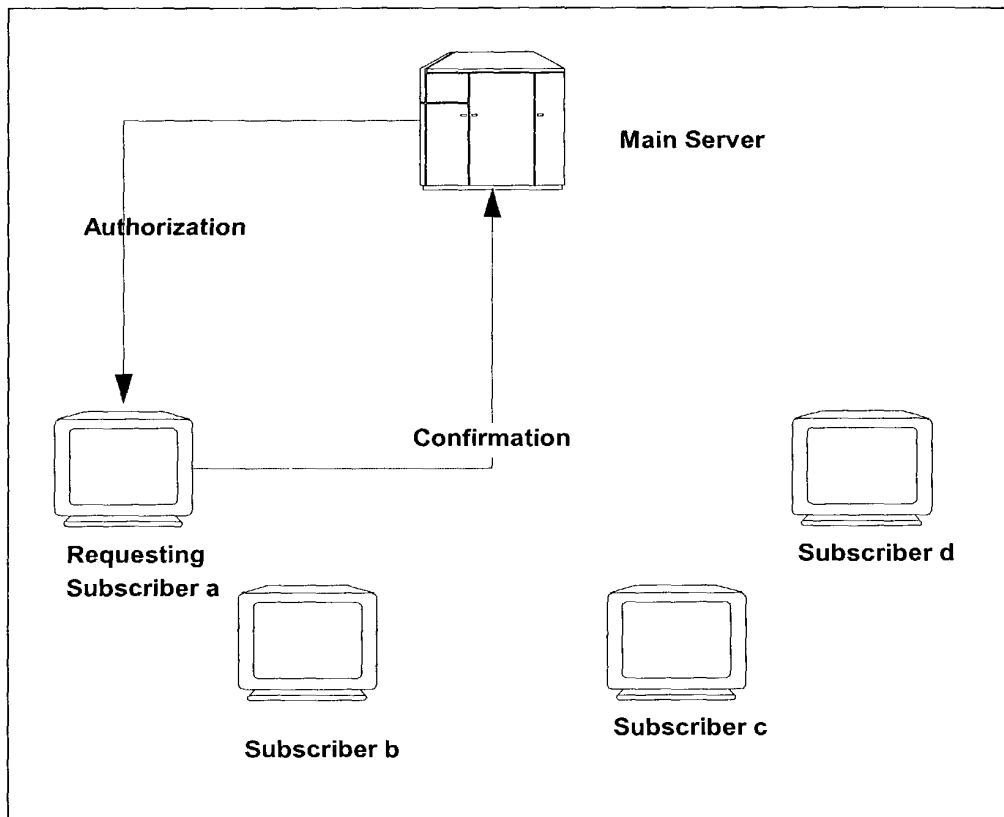


Figure 7

Background of the Invention

1. Field of the invention

This invention pertains to the field of electronic media delivery and in particular video on demand and security.

2. Description of Related Art

Current choices for watching a movie at home is to go to the rental store and select a movie only to return the movie to the store a couple of days later. Or select from the limited number of choices offered on pay-per-view or one of the movie channels.

To deliver the variety of movie choices available at a video rental location to the home in the traditional method would be prohibitive due to the excessive bandwidth requirements of the content provider. Bandwidth expense and limited access forces media distributors to offer limited choices available at specified times.

Summary of the Invention

The present invention solves a problem of prohibitive bandwidth requirements for content provider in delivering video on demand, and solves billing, copy, and trademark concerns of distributed media. The invention does this by shifting the bandwidth requirements away from the content provider to the subscriber network.

A first preferred embodiment of the invention partitions the media into small segments, and then distributes the pieces to subscribers' hard drives. A request is sent to the main server for a specific media offering by a subscriber. The main server sends out a message to subscribers to send any part of the media that is stored on their system directly to the subscriber who is requesting the media. When the requesting subscriber has received all parts of the movie, a message is sent to the main server requesting the encryption key to unlock the movie. At this time billing information is recorded.

An additional benefit of the act of sending the media in pieces to many different locations provides a high level of security and deterrence to piracy. No single location has more than a small segment of a media file that by itself would be useless to potential wrong doers.

Brief Description of the Drawings

FIG. 1 is a depiction of a full-length movie in digital form.

FIG. 2 is a depiction of a chronologically segmented movie in digital form.

FIG. 3 is a depiction of a non-chronologically segmented movie in digital form.

FIG. 4 is a diagram showing the initial deployment of movie segments.

FIG. 5 is a depiction of a subscriber's hard drive with stored movie segments.

FIG. 6 is a diagram showing the delivery of movie segments to a subscriber.

FIG 7 is a diagram showing the notification to the main server that all movie segments have been received and an authorization message being sent to the subscriber.

Description of the Preferred Embodiments

With reference to **FIGS. 1,2, 4-8**, a first, preferred embodiment of the present invention is described. A method to electronically distribute a wide variety of media to a multitude of locations upon demand without requiring bandwidth from the supplier for each viewing request.

The invention as described facilitates distribution of any electronic form of media, however for purposes of illustration, distribution of a movie library will be outlined. A movie in its entirety is converted into a digital format. The movie is split into segments **FIG. 2**, each of which is label with a header containing identifying information to specify the movie, and the segment number of the movie. The movie is segmented to reduce subscriber bandwidth requirements in the actions later illustrated in **FIG. 6**.

A server attached through a high-speed connection to the Internet will distribute a segment to hard drives located in the set-top box, or computer or other storage medium of various **subscribers a,b,c,d FIG. 4**. Each **subscriber a,b,c,d** will receive one segment of the movie. For illustration purposes four **subscriber a,b,c,d** sites are shown. In reality the movie will be segmented into many pieces and distributed to many individual subscribers. Each segment is sent to a plurality of subscribers to provide redundancy of the segment in the event a subscriber's hard drive becomes inaccessible. The main server can track which segment is held by each **subscriber a,b,c,d** to optimize the network's redundancy, and replace copies of each segment when necessary. Each subscriber will contain segments of a plurality of movies **FIG. 5**. Because each subscriber contains only a small fraction of any movie, there is a high level of security and copyrights are secure.

When a subscriber, such as **subscriber a** desires to view a movie, a request is sent either over the network directly to other subscribers or to the main server which then sends a message to the **subscribers b, c,d** who are storing the segments of the movie on their hard drives. Copies of the movie segments are then sent directly to the requesting

subscriber a from the **subscribers b,c,d** who have stored segments on their hard drives **FIG. 6**. These actions are automatic and require no input from the **subscribers b,c,d** who have the stored segments. If any segments are not received by the requesting **subscriber a** another request will be made for the missing segments. Subsequent requests will be made until all segments have been received by **subscriber a**.

When all segments to the movie have been received by **subscriber a**, a message will be sent to the main server **FIG. 7**. An authorization reply by the main server will enable the **subscriber a** to view the movie. The information received by the main server can be used for billing, tracking and marketing data.

In an alternative embodiment, the movie can be split into smaller segments and recombined into bundles or a single file consisting of non-chronological segments **FIG. 3**. Segmenting and recombining the movie into a non-chronological file bundle will provide heightened security. Each **subscriber a,b,c,d** will store even smaller portions of the movie on their hard drive. The bundling of non-sequential segments of a large file into smaller files to be distributed to various hard drives could be valuable to sensitive or classified information. If the segments were made very small to the scale of a few bytes, or even single bits, decoding of any individual file bundle would be virtually impossible. Each bundled file contains a small fraction of the original file, in an order that would make no sense without the other bundled files. This would be particularly valuable to government or corporate classified information. Access to the right method to recombine and the location of the bundles to create the original document could be stored, in a password-protected file, linked to an encryption key, or it could be locked to all devices except the specific hardware device that created the bundled files.