

## **Answer on Question #53536, Engineering / Software Engineering**

**Task:** Explain about the data stream characteristics in VoD application.

**Answer:**

Video on demand (VOD) are systems which allow users to select and watch/listen to video or audio content when they choose to, rather than having to watch at a specific broadcast time. IPTV technology is often used to bring video on demand to televisions and personal computers.

The basic characteristics of the video-on-demand data is that there are multiple concurrent data streams, one for each subscriber who is being served by the data storage subsystem. In order to increase the efficiency of operation of the video-on-demand system, it is important to maximize the number of uninterruptable data streams that can be produced by the data storage subsystem. In this regard, the present data stream optimization system is implemented by the processor of the data storage subsystem and functions to adjust the precaching of data from the backend disk drives one to another to the cache memory of the data storage subsystem to create an uninterrupted data stream for the subscribers. By adjusting the performance of the data file precaching operation, the data stream optimization system can maximize the number of subscribers served for the size of cache memory provided, while maintaining sufficient data in the cache memory to avoid exhaustion of any data stream provided to the subscribers.

However, the subscribers can pause, fast forward, rewind, and each data stream is therefore not extinguished at a uniform and predictable rate. For example, when the subscriber fast forwards a data file, every  $n$ th frame is retrieved and transmitted to the subscriber for viewing to thereby enable the subscriber to proceed quickly through the program without undue delay. The data stream optimization system must therefore balance the need to read ahead to retrieve data and the need to not deplete the data that is stored in the cache memory so that the data stream transmitted to the subscriber is not interrupted.

Television VOD systems can either stream content through a set-top box, a computer or other device, allowing viewing in real time, or download it to a device such as a computer, digital video recorder (also called a personal video recorder) or portable media player for viewing at any time.

Download and streaming video on demand systems provide the user with all of the features of Portable media players and DVD players. Some VOD systems that store and stream programs from hard disk drives use a memory buffer to allow the user to fast forward and rewind videos.

It is possible to put video servers on local area networks, in which case they can provide very rapid response to users. Streaming video servers can also serve a wider community via a WAN, in which case the responsiveness may be reduced. Download VOD services are practical to homes equipped with cable modems or DSL connections. Servers for traditional cable and telco VOD services are usually placed at the cable head-end serving a particular market as well as cable hubs in larger markets. In the telco world, they are placed in either the central office, or a newly created location called a Video Head-End Office (VHO).

Push video on demand is a technique used by a number of broadcasters on systems that lack connectivity to provide true video on demand or by broadcasters who want to optimize their video streaming infrastructure by pre-loading the most popular contents to the consumer device. A push VOD system uses a personal video recorder (PVR) to store a selection of content, often transmitted in spare capacity overnight or all day long at low bandwidth. Users can watch the downloaded content at the time they desire, immediately and without any buffering issue. As

content occupies space on the PVR hard drive, downloaded content is usually deleted after a week to make way for newer programs. The limited space on a PVR hard drive means that the selection of programs is usually restricted to most popular content. A new generation of Push VOD solution recently appeared on the market which, by using efficient error correction mechanisms, can free significant amount of bandwidth and that can deliver more than video e.g. magazines, interactive applications.