Chapter 16

Audio and Video Streaming in Online Learning

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INTRODUCTION

Online Learning Systems provide educational and training services at any-time, in any location, and often when the resources would not otherwise be available. Major technologies that have been responsible for the growth of online learning include advances in PC technologies, improved connectivity, better bandwidth capabilities of the Web, video conferencing, and the streaming of audio and video. Audio and video streaming technology will play a key role in most online learning programs of the future. In the past, audio and video files were directly accessed from the Web servers and were subjected to larger wait time for a user browsing the Web. Today, live videos can be displayed without wait time using streaming technology.

The two major players in media streaming technology are Microsoft and Real Networks. Both provide the media servers, content development tools, and streaming media players. Version 4.0 of Windows Media Technologies contains a rich suite of products and features that you can use to create, deliver, and play streaming media for applications ranging from news and entertainment to e-commerce, corporate communications, and distance learning.

Windows Media On-Demand Producer, a component of the Windows Media Tools, simplifies the creation of streaming media content. Once your streaming media content is created, you can publish it on a media server using Windows Media On-Demand Producer. Similarly, RealProducer, an integral part of the RealNetworks RealSystem 8, creates streaming media from audio and video. The media clips can be published on a RealServer using RealProducer.
ACCESSING MEDIA FILES USING HTTP AND USING REAL TIME TRANSPORT PROTOCOL

Web browsers and Web servers form a client/server architecture that uses packet-switched messaging via the Internet. They use HTTP to transport Web documents composed of hypermedia across the Internet. Figure 1(a) and Figure 1(b) show the setup of a Web system for accessing video/sound files via HTTP and via Real Time streaming protocol respectively.

The protocol steps required for retrieving a sound file called sample.au, using HTTP and a streaming protocol, is listed below:

i) Click on the hyperlink that points to sample.au on the webpage.

ii) The Web browser translates this into a GET request containing the name of the file to be retrieved and sends this request off to the server.

iii) The Web server will respond to this request by sending a response message. In the first case the server sends the sound file within a HTTP response message. In the case of Real Time Streaming Protocol the HTTP response message does

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**Figure 1(a). Set up of a Web system for accessing video/sound files via HTTP**

- Web Client
  - Video/Sound Helper
  - HTTP
  - Web Server
  - Client Machine

**Figure 1(b). Introducing a streaming protocol by adding a new client/server pair**

- Web Client
  - Video/Sound Helper
  - HTTP
  - Streaming Protocol
  - Web Server
  - Server Machine 1
  - Server Machine 2
  - Client Machine
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