

STREAMING MEDIA

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ABSTRACT

In the era of the high-speed development of Internet, multimedia technology develops gradually mature. In order to solve the limited broadband and crowded network and to achieve the transmission of narrowband network video, audio, animation and other multimedia information, produces a multimedia technology of transferring information real-time in data flow---Streaming Media. Streaming media is multimedia that is constantly received by and presented to an end-user while being delivered by a provider. With streaming media, a user does not have to wait to download a file to play it. Because the media is sent in a continuous stream of data it can play as it arrives. Users can pause, rewind or fast-forward, just as they could with a downloaded file, unless the content is being streamed live. In those days, it was impossible to listen to a music or movie file of any size without a long and tedious wait. The problem was essentially a matter of bandwidth. Data (computerized information) moves efficiently across the Internet by being broken up into little bits known as packets. With streaming, you start to use the packets as soon as enough of them have arrived [1][2][4].

Keywords: Computerized Information, Multimedia, Streaming Media, TCP/IP, HD-quality video, LIVE TV

I. INTRODUCTION

Types of Streaming Media

Genuine Streaming: Most Internet radio stations use genuine streaming, downloading and playing simultaneously with a program like RealPlayer, Apple's QuickTime, or the Microsoft Windows Media Player (the three rival types of streaming). With a broadband connection, you can enjoy audio quality that's not far off the quality you get from a downloaded MP3 file (though, as we discuss in our article on MP3, that's never quite as good as you'd get from a CD). As Internet connections have become faster, and more people have broadband, it's become possible to watch videos and TV programs this way too, though unless you stream in high definition over a really fast broadband line, quality is still far short of what you'd get from watching TV or a DVD. That's one reason why online movie stories still sometimes use downloads instead of streaming [1][2].

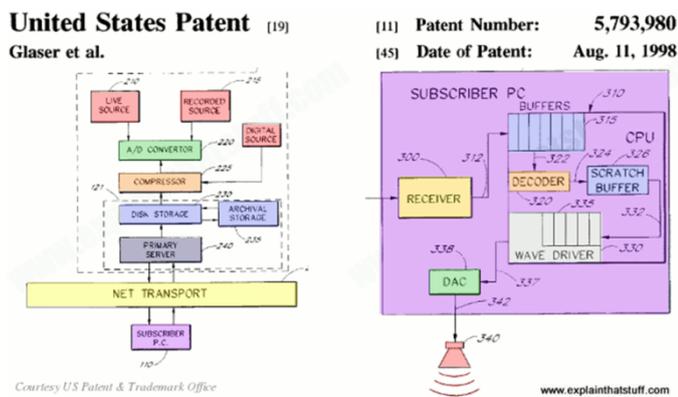
Pseudo-streaming : progressive downloading: Not all websites that appear to stream video work by streaming. Some (including YouTube) actually use an alternative

approach called progressive downloading (fast-start streaming), which is like a cross between conventional downloading and streaming. A large chunk (and sometimes all) of the file you're watching downloads into your web browser's cache (its internal working memory buffer) and your browser plays it simultaneously. Unlike with a truly streamed video, you can't always skip forward: generally you have to wait for the file to download to the point you want to see. Another key difference is that the file remains in your browser cache even when you've finished watching. You can tell when a website is working by progressive downloading because the video window will show two separate indicators on a progress bar, like the one below: one shows you how much of the file has downloaded, while the other shows how much you've played. Typically, progressive downloading uses Macromedia Flash files (with SWF or FLV extensions), that are served from a conventional web server and played on a Flash plugin installed in your browser. It's popular because it's often quicker and easier to implement than genuine streaming. [1][2].



HOW REAL STREAMING WORKS:

The artwork below, taken from Rob Glaser's original patent, shows how streaming media was originally designed to work. The figure on the left shows how sound is packaged and sent as digital data to your computer (the purple box at the bottom); the one on the right shows how your computer receives, unpacks, and turns this data back into sound. Let's look at these two steps (transmission and reception) in a bit more depth [1][3].



II. METHODS AND MATERIAL

Transmission

Schematic diagram shows how a Real Player packs and unpacks audio data streamed over a telephone line.

Live or recorded sound (red boxes) is made from analog (continuously varying) sound waves. So, at the transmitting end, the first step is to convert these waves into digital data using an ADC (green). Next, the digital data is compressed (orange) by over 95 percent (in the original patent, they quote a figure of 22:1) so it can be transmitted more quickly. The compressed digital data is stored (light blue) and then progressively transmitted by a server (dark blue) over the Internet (yellow) to your PC (purple). Of course, there's no reason why lots of programs can't be compressed and stored indefinitely in a library and then streamed whenever people want to listen to or watch them, but don't forget that Real Player was originally designed so it could stream things like

live radio shows as they were transmitted from the studio. It's also worth noting that the original version of Real Player shown here was designed to be able to send real-time audio across grindingly slow dialup Internet connections (as slow as 14.4 Kbps); modern streaming can send high-definition video over broadband connections hundreds of times faster, but works in essentially the same way [3].

Reception

Inside your PC, a similar process runs in reverse to turn the digital data you receive back into sound. Packets of data are received down a phone line from the Internet (yellow) and stored in buffers (small bits of DRAM memory, blue). The buffers are designed to be as full with data as possible: if they're too empty, because the audio isn't being transmitted fast enough, there's a risk of the audio playback being interrupted (which is when you see the annoying "Buffering" message). The data from the buffers is decoded and decompressed (orange) and passed to a wave driver in a sound card (light gray), which generates streams of audio still in digital format. A digital-to-analog converter turns these streams into analog signals that power a loudspeaker, hopefully recreating a faithful version of the original sound (red) [3].

What about errors?

Garbage in, garbage out—so goes the old saying in the computer business. So if the data from the "transmitting" server gets corrupted, won't you hear poor quality audio from your loudspeaker? The modems sending and receiving data use error control/correction protocols to ensure that the data that's received is the same as the data that's transmitted [2][4].

Artwork : How streaming works in a Real Player. From US Patent: 5,793,980: Audio-on-demand communication system by Rob Glaser et al, Real Networks, August 11, 1998, courtesy of US Patent and Trademark Office.

Difference between downloading and streaming

- 1) Speed-

Downloading: Unpredictable: Download time is unrelated to playing time. For example, An album could download in 5 minutes or 5 hours depending on its size, your net connection, and web traffic.

Streaming: Generally, a 1 hour video will stream in roughly 1 hour, unlike downloading, streaming media can be used for "live-live" transmission of events as they happen (also known as webcasting) [1].

2) Quality-

Downloading: Uses traditional TCP/IP connection with a system that automatically corrects errors. Any lost or damaged packets (downloaded chunks of data) are retransmitted. The file you eventually receive on your computer is an exact copy of the file that was on the server.

Streaming: Packet losses are ignored (not resent), but that doesn't usually matter because digitally streamed video and audio is converted back into analog format before we watch it or listen to it. Any packets lost during streaming simply add "surface noise" to an audio stream or degrade the picture quality of a video (for example, with excessive pixilation where the picture disappears into square blocks) [1][2].

3) File Type

Downloading: A download is a single file with all the relevant data packaged together. So if you're downloading a movie, everything is packaged into a single movie file with a file type something like MPEG4.

Streaming: If you stream a movie, each different part of the movie (sound, video, subtitles, or whatever) is transmitted as a separate stream. The movie player reassembles and synchronizes the streams as they arrive at your computer. But any extra high definition streams with slow internet would cause periodic pauses and buffering [1].

4) Encoding Decoding

Downloading: Files can be instantly uploaded to a server for immediate downloading.

Streaming: Files have to be compressed and then encoded (turned into discrete, digital packets) before they can be streamed. People watching or listening to streamed files have to have appropriate decoding files installed on their computers (known as codecs) for turning encoded, computerized, digital files back into analog sounds and pictures. In practice, that means you need a plugin in your web-browser to handle whatever streaming media files you want to receive (and you'll need separate plugins for QuickTime, RealPlayer, and so on) [2].

5) Multiple Users

Downloading: The more people ("clients") download a file at the same time, the harder the server has to work, the slower it works for each client, and the longer it takes you to download—irrespective of how fast an Internet connection you have.

Streaming: In traditional streaming (unicasting), each client takes a separate stream from the server—necessarily, because different people will start streaming the same video or audio program at different times. Multicasting is a more efficient kind of streaming that allows a streaming server to produce a single stream that many people can watch or listen to simultaneously—for example, if lots of people are watching a football game live online at the same time. Some media players automatically use multicasting when they can.

III. RESULTS AND DISCUSSION

Applications:

- Makes it possible for users to take advantage of interactive applications like video search and personalized playlists.
- Allows content deliverers to monitor what visitors are watching and how long they are watching it.
- Provides an efficient use of bandwidth because only the part of the file that's being transferred is the part that's being watched.
- Provides the content creator with more control over his intellectual property because the video file is not stored on the viewer's computer. Once

the video data is played, it is discarded by the media player.

- To use Streaming Media technology to conduct modern distance education.
- Use of streaming media by YouTube, Vimeo and other LIVE TV and multimedia broadcast due to high synchronicity.

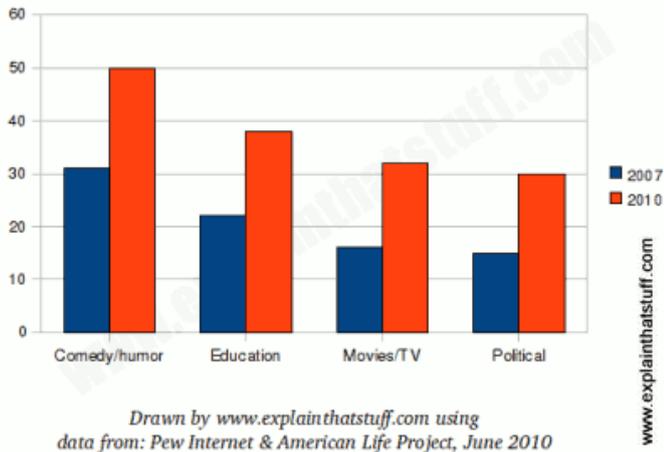
5vSvNVx-8BhTeU6U88&hl=en&sa=X&ved=0ahUKEwipwa30-fHRAhWHRo8KHdJEAZsQ6AEIPTAE#v=onepage&q=Genuine%20multimedia%20streaming&f=false

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[3]. <http://www.explainthatstuff.com/streamingmedia.html>

[4]. <http://whatis.techtarget.com/definition/streaming-media>

Growth in % of Internet users watching video



IV. CONCLUSION and FUTURE SCOPE

Streaming media—bringing music and videos on demand—may seem advanced compared to the kind of technology people had a few years ago, but it's still relatively primitive. The audio and video information you download has to be compressed dramatically (substantially reduced in quality to make smaller files) so it downloads in a reasonable amount of time. Most streaming videos are still quite small and "pixelated" (full of obvious square blocks) when they play on something like YouTube. That's because even today's best broadband connections are not fast enough to download the huge amount of information in a full screen, high-definition TV picture. In a few years, when broadband connections are many times faster, it will be possible to stream HD-quality video over the Net. Then the age of information-on-demand really will have arrived [3][4].

V. REFERENCES

[1]. <https://books.google.co.in/books?id=YgVzAwAAQBAJ&pg=PA424&lpg=PA424&dq=Genuine+multimedia+streaming&source=bl&ots=iaZ8YgE2PF&sig=XkB5IM7nD>