Intro to digital audio and streaming

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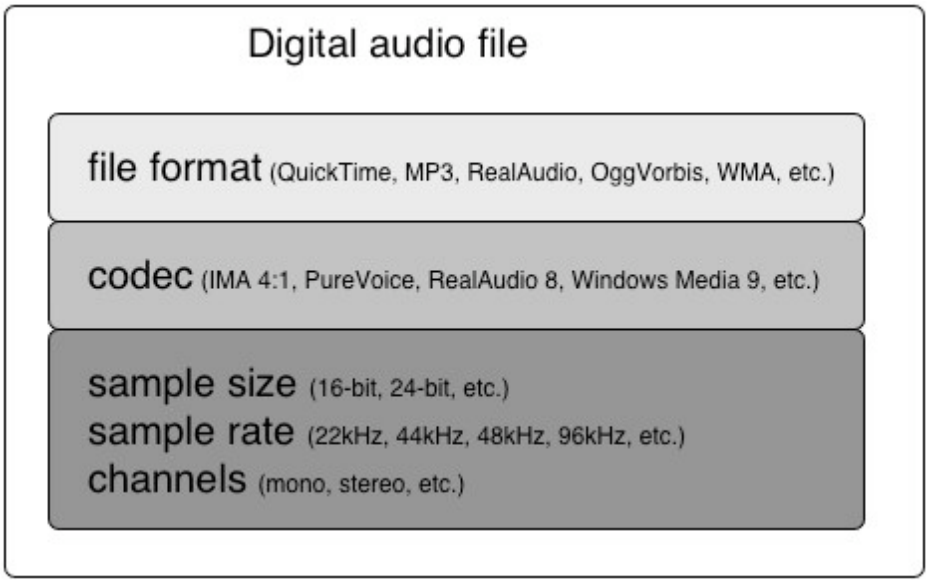


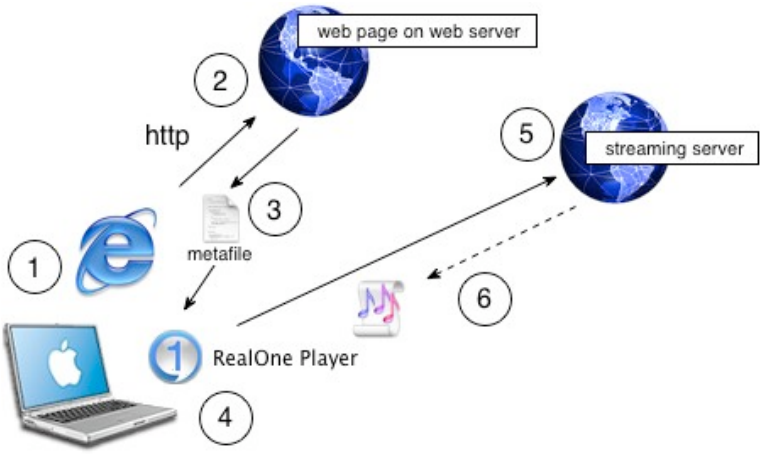
Streaming media

Streaming delivers media in a steady *stream*, via the internet.

> *http:* pseudo-streaming (often called “progressive download”) delivers the entire file to the user; playback during download gives the appearance of streaming.
>
> *rtsp:* (real time streaming protocol) delivers the file in a steady stream of small pieces. No waiting to jump forward in an on-demand stream. File does not download to the user, only buffers in memory.

The http: protocol is the same protocol used to request and deliver normal web pages.

Real streaming via rtsp: offers some additional protection for your content: it makes it more difficult for users to make copies of media.



Typical streaming process with RealAudio:

1. User launches browser
2. User connects to a web page and clicks a media link (.ram)
3. Web server delivers a metafile
4. Metafile launches the media player and passes it rtsp: address
5. Media player makes rtsp: request to the streaming server
6. Streaming server streams the media file

Metafile syntax for RealAudio files:

A .ram (RealAudio Metafile) is just a plain text file with contents like this:

rtsp://sheridan.it.northwestern.edu:557/dms/samples/freeaudio.rm

protocol | server address and port | directory path & file to be streamed

Network connection speeds

Because the content is coming in a steady stream, the speed and stability of the network connection is critical to the success of a streaming session.

Usually expressed in bits (not BYTES) per second, and are called “data rates” or sometimes “bit rates.” Remember that there are 8 bits per byte.

Common network speeds:

Gigabit Ethernet	1,000 Megabits per second
Fast Ethernet	100 Megabits per second (100 Mbps)
Cable Modem	Varies: 200Kilobits per second – 2Megabits per second (200Kbps – 2Mbps)
DSL	Varies: 128Kilobits per second – 1.5Megabits per second (128Kbps – 1.5Kbps)
ISDN	128Kilobits per second (128Kbps)
56K Modem	56 Kilobits per second (56Kbps)

Prepare your digital audio with a data rate that matches your audience's network speed:

Calculating data rates:
((Sample rate) * (sample size) * (# of channels)) / compression ratio = Data rate

Example: (96kHz * 24-bit * 2 channels (stereo)) / 1 = 4,608 kbps

Calculating file size:
((Data rate in bits per second) / (8 bits/byte))* (duration in seconds) = file size in bytes

Example: ((4,608 kbps) / 8)) * 60 seconds = 34,560 kilobytes per minute of audio (34.5 Megabytes)
An hour of audio at this rate will require 2,073,600 kilobytes (2.07 Gigabytes)

Digital Media Services default RealAudio **settings** for music delivery:

SureStream (multiple streams within a single file for multiple audiences)
Stream 1: 20Kbps Stereo Music
Stream 2: 64Kbps Stereo Music

Additional resources:
Digital Audio Primer from ExtremeTech:
Full URL: <http://www.extremetech.com/article2/0,1558,1460716,00.asp>
Tiny URL: <http://tinyurl.com/yt8of>

Streaming Media F.A.Q. from RealNetworks:
Full URL: <http://www.realnetworks.com/resources/startingout/get_started_faq.html>
Tiny URL: <http://tinyurl.com/2tzxs>

Broadband Buyer. Network speed charts show typical costs for levels of service.
Full URL: <http://www.broadbandbuyer.com>