

Streaming Media

A Visual Primer

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What is Streaming Media?

Streaming media enables *real-time* or *on-demand* access to *audio, video, and multimedia* content via the Internet or an Intranet.

Common Applications

- Corporate communication
 - E-broadcasts
 - HR policies
- E-Learning
 - End-to-End Learning Modules
- Sales and Marketing
 - Pre-sales demos
 - Customer Support

There's a whole lot of streaming going on...

Audience Demographic	November 1999	November 2000	Percent Increase
Females	9M	16M	77%
Males	12M	19M	56%
Kids/Teens	4M	7M	65%
Seniors	700K	1.4M	95%

Are you a Streamie?

- Who are they?
 - 43% of all Web-users
 - 24% of all Americans
 - Most experienced web-users
 - Spend 46% more time online than the average person.
 - Are more likely to live in homes with \$50,000+ annual income (49 percent) than the national average (34 percent).
 - "The Buying Power of Streamies", Arbitron/Edison Research, Feb. 2000
 - "Internet 8: Advertising vs. Subscription - Which Streaming Model Will Win?"

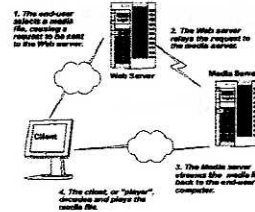
Internet 8

- Approx. 40M Americans (17 percent – up 4 % from 2001) listened to audio or watched video in a typical month
- Approx. 80M Americans (35 percent – up 11% from 2000) have accessed streaming audio or video
- Half of video streamies said they watch online video content that is not available via existing TV or cable
- Home broadband Internet access surged to 21 percent (January 2002 – up 9% from 2001).

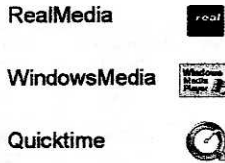
Real-time or On-demand

- Webcast – near live broadcast as the event occurs.
- VOD (Video on Demand) pre-recorded video that can be accessed on demand.
- Scheduled Webcast – Archived webcast that is available at a certain time.

How does it work?



Architectures



An architecture is comprised of encoding and transmission methods, server software, and client software or players.

Streaming Media Formats

A format is a file structure an architecture creates with its codecs (compressor-decompressor)

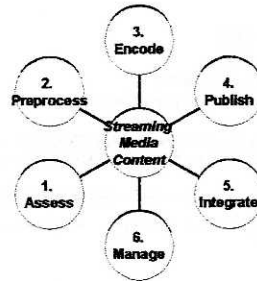
Architecture	Native Formats	Streaming Media Extensions
Quicktime	Quicktime Format	.mov, .sdp
RealMedia	RealMedia Format	.rm, .ram, .smil
Windows Media	Advanced Streaming Format or Windows Media Video/Audio	.asf, .wmv, .wma, .asx, .wax, .wvx

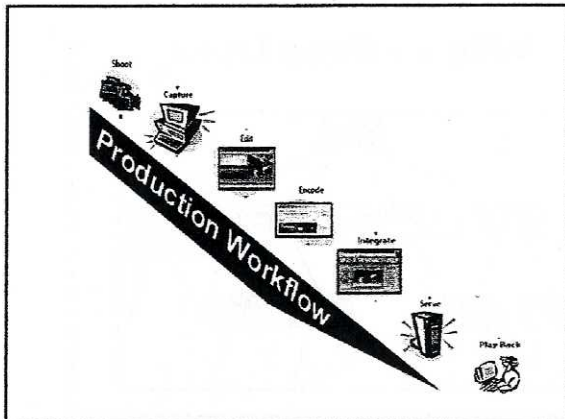
Who is your audience?

"It is important to decide what constitutes acceptable delivery standards. If the limit is a delivery platform for narrowband, you will be accepting severe performance limitations. Conversely, if a higher standard is set, such as residential broadband, you will have more flexibility."


-H. Peter Alesso, e-Video

Streaming Media Workflow





Production: It's a balancing act!
Complexity vs. Quality



- Minimize movement
- Use a tripod
- Keep the background simple
- Avoid complex textures and stripes
- Avoid "Hot" colors
- Avoid harsh contrast
- Get close
- Slow shutter speed

Remember audio!


Resolution/Space

Window Size	FPS	Color Depth	Data Rate per second
640 x 480	30	24	27.66MB
640 x 480	15	24	13.83MB
320 x 240	15	24	3.46MB
160 x 120	15	24	865 KB

What is a CODEC?

- Short for compressor/decompressor
- Codecs compress data as it is encoded and decompress data for playback.
- Use different codecs for different sources (audio/video).


Do you see the difference?



The CODEC will!

Encoding Movies

- Don't encode at 720X480
 - Noticeable artifacts
 - Larger file size
- Encode at 320X240 and use the player to zoom the video 2X
 - Select deinterlacing filters to reduce artifacts

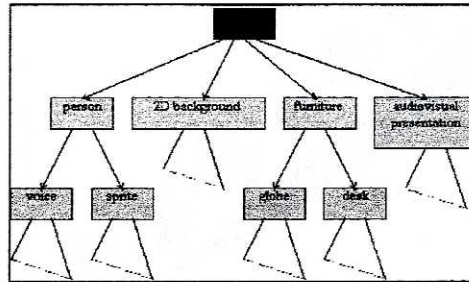


- ExtremeTech.com

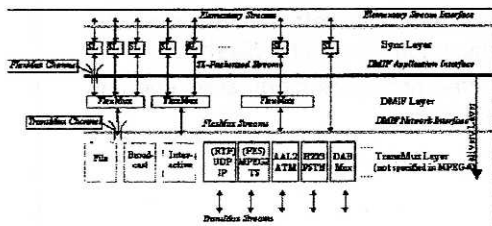
MPEG 4 Attributes

- All elements (stock ticker, close captioned feed, titles, audio/video assets) are maintained in separate objects in the stream.
- Video components can be also separately maintained.
- Each element can be interactive
- Streams can be customized for different connections and devices.

MPEG 4 – Object Layout



MPEG 4 – Data Delivery



MPEG 4 Assets vs. Liabilities

Assets	Liabilities
Simplified distribution to multiple target user groups across a range of devices and distribution mediums	Sub-optimal video quality translating to additional bandwidth costs
Greatly enhanced interactivity	Potential royalty liabilities
Universal platform support	Requires third party digital rights management system

Extreme Technologies – MPEG 4 Looks Great

The Future

- MPEG 7
 - Adds metadata, makes it easy to index
 - Defines a structure of descriptors and description schemes (not confined to images...can be sounds)
- MPEG 21
 - Manages digital assets
 - Supports commercial transactions and rights management

On Your Own

- A Streaming Media Primer
<http://www.adobe.com/products/aftereffects/pdfs/AdobeStr.pdf>
- Streaming Basics
<http://smw.internet.com/video/tutor/streambasics1/index.html>
- Internet 8 & other great research on streaming.
<http://www.edisonresearch.com>
- Web Server vs. Streaming Server
<http://www.microsoft.com/windows/windowsmedia/compare/webservvstreamserv.asp>
- A Digital Video Primer
<http://www.adobe.com/motion/events/pdfs/dvprimer.pdf>