Using Adobe Media Server to Deliver Live and On-Demand Video

Streaming Media East 2008

New York City

OVERVIEW: Adobe’s Flash Media Server offers a unique combination of powerful streaming and a flexible environment for creating and delivering engaging multidirectional social media experiences to the broadest possible audience. Attendees will learn about HD-quality video, integrated live video streams, delivery to mobile devices, and deeper interactivity through an extensible plug-in architecture. This workshop will also cover new features that include enhanced content protection with encrypted streaming, increased performance, and new logging/measurement tools to maximize the return on content investment.

Duration: 3 hours

Presenters:

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DO NOT DUPLICATE
Adobe’s Flash Media Server offers a unique combination of powerful streaming and a flexible environment for creating and delivering engaging multidirectional social media experiences to the broadest possible audience.

SESSION OVERVIEW

SETTING THE BAR – Introduction

Media Consumption is changing, customers are looking for:

1) Great Video Quality
2) Awesome Online Experience
3) Mountains of Content
4) Engaging and Social
5) Access Anywhere

Flash Media Server provides the technical facilities to deliver what the consumer wants and making it possible to have mountains of content online because of its natural protection schemes.

Great Video Quality

- Experience Workflow (From idea to Interactive)
- Production Workflow (From Creation to Distribution)
- Getting the best video quality
- Codec Review
- Flash Video Profiles
- Format Wars – discussion
- H.264 Video Codec
- Video Encoding – Rhozet Carbon Coder Demo
- Video Encoding Settings
- Live Video – Operation My Space Demo

Awesome Online Experience

- Why stream?
- Video from a Web Server (Progressive Download)
- Video from a Streaming Server
- Anatomy of a Streaming Server
- Quality delivery over the Network
- Tuning Flash Media Server – Demos
- Encoding for peak performance

Mountains of Content

- Industry overview
- Case Study: BBC
- Why put content online?
- DRM and Content Protection – Why bother?
- Protecting Online Content – Demos (SWF Verification / RTMPE / Etc.)
- Protecting Offline Content – Demo Adobe Media Player
- Monetizing Content
- Lowering the cost of Ownership

**Engaging and Social**

- Why Engage
- Why Socialize
- Flash Media Server Real-time features

**Access Anywhere**

- Unified Experience across all screens
- Open Screen Project
- Creative Process for Mobile
- DEMO: Show the experience re-purposing (Flash / Device Central)

**Wrap up / Q&A**
Adobe **Flash Media Server 3**
Enabling the Future of Video Consumption

Media Consumption Is Changing
What Does the Media Consumer want?
- Great Video Quality
- Awesome Online Experience
- Mountains of Content
- Engaging and Social
- Access Anywhere

www.hulu.com
Internet Video is Experiencing Explosive Growth

- 9 billion video clips
- 75% US internet users watch videos online
- 181 minutes per viewer per month
- 68 clips per month

2002 Flash 6 Player supports video
- 9 top video streams at supporting Flash
- 2005 CDN’s start supporting Flash
- 2006 Hi Q Live video introduced
- Flash Player 9 reaches 90%
- 2007 Emmy Award for streaming
- Over 75% of broadcasters who stream video on the web use Flash
- Over 75% of broadcasters use Flash to stream video on the web

Adobe Flash Player
Upgraded in 3 months

- 62% Adoption in 3 months after release
- HD Video + Standard Codec (H.264/AC3
- Increased Content Protection
- Improved Video rendering
- New Buffer management

MTV Video Remixer
build on Adobe Premiere Express

- Engage the audience
- Online Video editing
- Enhanced Seeking
- Content Protection
- Monetize

remix.mtv.com
Innovation on Flash
✓ Spherical Video
✓ live and on demand

www.immersivemedia.com

A scalable, real-time media server
- Flash Player 10
- Adobe Integrated Runtime (AIR)
- Flash Lite 3
- Adobe Media Player
- Customizable Services and Plug-ins

Full version: $995
- No limit on bandwidth
- No limit on connections

Full Version: $4,500
- Upgrade: $1,995
- Upsell (from streaming): $3,505
- No Limits
- Origin / Edge built in
- Customizable Services and Plug-ins

(Sneak Peak #1) Dynamic Streaming (Multi-bitrate) in 2008

Video Consumer
- Quick start video
- Highest quality for hardware
- Smooth switch
- No disruption in Audio

Flash Developer
- Monitor the stream
- Increase or Decrease quality
- Support for multiple files
- H.264 and VP6 support
Adobe **Flash Media Server 3**

**Great Video Quality**

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**Interactive Experience Workflow**

Great Creative tools, Attract the most creative people on the planet
They will want to build great interactive experiences

- Create
- Develop
- Experience

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**Production Workflow**

A complete, Customizable Cross-Platform Solution
To Create, Distribute and Monetize Content
Across Big, Small and Really Small Screens

**CREATION**

- Plan
- Acquire
- Produce
- Manage
- Publish
- Deliver
- Playback

**DISTRIBUTION**

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**Getting the Quality**

H.264, VP6, MP3, Nellymoser, AAC+. Speex
Quality is in the eyes and ears of the audience

"The Audience is listening" - a movie theatre somewhere
Flash-supported Codecs today

- **H.264 (FMS 3), VP6** Video
  - Use for high quality on-demand/live content
- **Spark from Sorenson** Video
  - Use for low latency real-time communications
- **AAC+** Audio
  - Use for high quality on-demand/live content
- **MP3** Audio
  - Use for high quality on-demand/live content
- **Nelly Moser** Audio
  - Use for low latency real-time communications
- **Speex (coming soon in FP10)** Audio
  - High Fidelity Lossy format for voice communications

Why MPEG-4?

- Excellent-quality video, low data rate
- More high quality video per server
- Author once, deliver anywhere workflows
- Take advantage of your current infrastructure and encoding investments.
- Formats: MP4, M4A, MOV, MP4V, 3GP, 3G2

Licensing for High Quality

- MPEG licensing is paid for on a royalty basis
- MPEG licensing is free for non-commercial use
- On2VP6 licensing is paid at the time of encode

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<th>TARGET RESOLUTION/ DATA RATE</th>
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<td>VP4 Mobile</td>
<td>(640x480)</td>
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<td>VP4 Mobile</td>
<td>(320x240)</td>
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Flash Video Profiles

Profile organization

- Video LT: Mobile
- Video SD: Standard Definition
- Video HD: High Definition

Why do we have format wars?

How does something become a standard?

- How it evolved
- How it became adopted
- How universal is H.264?
- When should users use it?
- When would users use something else?
- Which runtime should I use when?

Are the Video Format wars over?

No!
H.264 Video Codec

When do you use H.264?
- customer needs
- delivery devices
- content
- tools
- experience to be created
- business model

What it means for Content Creators
- Smaller file = Lower cost to deliver
- Industry Standard
- Encode once
- Higher quality potential: Up to “HD” resolution
- Workflow between production tools, Flash and delivery
- Ubiquitous playback on all platforms

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Some History on H.264

- Joint Video Team (VCEG + MPEG/ISO) 1998
- Goals:
  - Standard capable of good quality at lower bit rate
  - Flexibility to support broad array of networks and systems – DVD to Device
  - v1 of H.264: 2003 → v8 in 2007 → planned additions in the works
  - Evolved over time:
    - Main Profile fade and High Profile gained adoption
    - Still evolving and adapting (H10P, MVC)
  - Profiles to address different capabilities:
    - 7 profiles, 4 all-Intra profiles, 3 scalable profiles, more to come...
    - Patents + Licensing

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Video Encoding Settings

General Encoding Tips
- Video Source
- Variable vs. Constant Bitrate
- Pixel Size
- Frame Size (HD / SD)

H.264 Encoding Tips
- FFMPEG, x264, Mencoder and Nero AAC.

5 reference frames, 5 B-frames, aethomatic B-frames, B-pyramid enabled, adaptive macrrobloc type, advanced Trellis on, SubQ=7, advanced exagon search, deblocking filter with custom alpha e beta parameter, three pass encoding...
Adobe Flash Media Encoder 2.5

- H.264 Live + Live AAC
- Encode from any input
- Command-line based for remote streaming
- Local Archive

Live Video

 Reached millions of viewers around the globe with exceptional HD Live Flash Video quality

Operation MySpace

Why Stream Video?

- Put video on a web server
- Put video on a streaming server

Awesome Online Experience

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**Video from a Web Server**

- Challenges of Progressive Download:
  - Uses more bandwidth on Server + Client
  - No File Protection
  - No Seeking into large files
  - Reliant on Disk
  - No insight into video experience
  - No Buffer management
  - No Live support

**Video from a Streaming Server**

- Benefits of Streaming:
  - ✓ Bandwidth usage can be managed
  - ✓ Content is protected
  - ✓ Seeking into large files
  - ✓ Uses RAM to deliver video
  - ✓ Dynamic client-side buffer
  - ✓ High Quality Live support
  - ✓ Better Mobile support

**Anatomy of a Streaming Server**

- Basic Streaming Server:
  - Logging
  - Caching
  - Buffer
  - Live
  - Serve and Destroy
  - Deploy & Maintain
  - Capacity & Performance
  - Network & Platform
  - Configuring and Tuning
  - Extending Functionality

- Adobe **Flash Media Server 3**:
  - Ubiquitous platform
  - Client-side Experience
  - Real-time Encryption
  - Dynamic Client Buffering
  - Real-time video compositing
  (Alpha channel support)
  - Video overlay
  - Data streaming + Event push
  - Video Capture and Record

**Quality Delivery over the Network**

- Deliver the best experience when Network conditions are unpredictable:
  - ✓ Tuning the Server
  - ✓ Bandwidth Detection
  - ✓ Multi-bitrate Encoding
  - ✓ Error Handling
  - ✓ Monitoring Quality of Service
  - ✓ Analyzing playback behavior
**Tuning Flash Media Server**

Demos:
- Origin / Edge Configuration
- Distributed Cores
- Rolling Scopes

**Encoding Strategies**

To get the most out of your streaming:
- Encode to Multiple bit rates
- Detect bandwidth before streaming
- Use Dynamic Buffer

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**Mountains of Content**
BBC Launches Flash Powered Video On Demand Service

Problem Faced:
Need for cross-platform, cross-browser, high-quality online playback of broadcast content

Adobe Solution Employed:
By adopting Flash Player software for the BBC iPlayer, viewers can catch up on their favorite shows online with a high-quality streaming video experience; future plans include incorporating radio and offering BBC iPlayer on a range of platforms including cable, mobile, gaming consoles and other handheld devices.

Benefits:
- Developed and launched in less than 10 weeks
- Volume and viewership jumped 8x in first month
- Average streaming session at launch was 25 minutes
- Provides a consistent user experience for the majority of streamed video and audio
- Ensures all rich media content is accessible to the widest possible audience
- Flexibility and ubiquity of Flash will allow BBC iPlayer to be deployed beyond the desktop

Why put video online?
It will cost you money if you are not careful

DRM + Content Protection

Connected

Disconnected

 Protecting Online Content

- DEMO: Protect the SWF file
- DEMO: Encrypt the channel in real time
- DEMO: Restrict Access
- DEMO: Prevent the Replay
Protecting Offline Content

Challenges
- Protect content without being online
- Tamper-proof play lists
- Track and Report usage

Adobe Solutions
- Flash Media Rights Management Server
- Adobe AIR
- Adobe Media Player

Monetizing Content

Options for Monetization
- Free, Ad-supported content (trend in NA / EMEA)
- Pay-per-use (trend APAC / Japan)

Flash can help
- Flash is the defacto standard for rich media Ads
- Transparent video overlay for Ads
- Visually seamless integration with Ad systems
- Client-side tracking
- Speed to Market (encryption not needed)
- Adobe Media Player

Lowering the Cost of Ownership

- Server Costs
  - FMS 3 reduced prices up to 90%
- Platform
  - (Linux & Windows)
- Protecting Content
  - (RTMPE / SWF Verification / No Client Cache)
- Hard costs (electrical / cooling / hosting)
  - Higher Performance = lower costs

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Engaging and Social
Why Engage?

- Keep eyeballs longer
- Involve viewers + get them to invest
- Draw back user over and over
- Look at Video games
- Addiction is good for business

Why Socialize?

- Media Consumption is changing
- Reach a larger audience
- Reach a younger audience
- Monetize through Advertising
- Discover new video (Web Channel Surfing)

Flash Media Server helps Engage and Socialize

- Realtime engagement
- Content Protection
- Custom video solutions
- Engaging experiences

DEMO: Video Engagement

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Access Anywhere
Adobe Open Screen Project

- Industry collaboration across device manufacturers, carriers, media companies, hardware and software providers
- Deploy consistent runtime environment across desktops & devices
- Maintain compatibility and support rapid innovation by enabling devices to be updated seamlessly

Adobe’s Support of Open Screen Project

- Removed license restrictions on use of the SWF and FLV/4V specifications
- Removing licensing fees
- Publishing device porting layer APIs and the AMF and Flash Cast protocols
- Working with partners to make Flash Player and AIR updateable OTA
- Working with partners to open distribution to web designers/developers

* Previously announced

Adobe Flash Lite

- Over 500 Millions Devices
- Support for On2 VP6
- Support streaming
- H.264 supported soon

Developing for Mobile
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The Universal Media Delivery Platform

Built-in streaming services
- Video on demand service
- Live publishing point

Live publishing enhancements
- Data keyframes
- Multipoint publish

Security enhancements
- Encrypted RTMP (RTMPE)
- Authenticate SWF files

Plug-in support
- File plug-in
- Authorization plug-in
- Access plug-in

Performance improvements
- 2X more capacity per server
- Published performance benchmarks
- Distribute over multiple processes
- Limit connection requests
- Close idle connections
- Native bandwidth detection
- Configure optimal stream cache

Platform Standards and Compliance
- H.264 video and HE-AAC audio support
- AMF3 support
- IPv6 Compliance (required for GOV)

Administration Tools
- FMS Check Tool
- FLV Check Tool
- Simplified Configuration

Adobe Flash Media Server 3
delivering a great video experience

Full version: $995
No limit on bandwidth
No limit on connections

Full Version: $4,500
Upgrade: $1,795
Upsell (from streaming): $3,505
No Linux
Origin / Edge built-in
Customizable Services and Plug-ins

Full version:

Go FMS!
www.adobe.com/go/fms

www.adobe.com/devnet/flashmediaserver