











November 2010-2011 The world has changed

	PRODUCTION Adobe Creative Suite Production Premium 5.5
	DELIVERY Adobe Flash Media Server 4.5 <i>with HLS streaming to Apple devices</i>
	PROTECTION Adobe Pass for TV Everywhere Adobe Flash Access 3 (DRM)
	PLAYBACK Adobe Flash Player 11 Adobe AIR 3 / AIR for IOS / AIR for Android OSMF 1.6
	OPTIMIZATION Acquisition of DemDex Adobe Digital Marketing Suite (Omniture)
	MONETIZATION Acquisition of Auditude for Ad Delivery

Adobe Video Solutions Product Lineup

Driving media businesses across all Screens

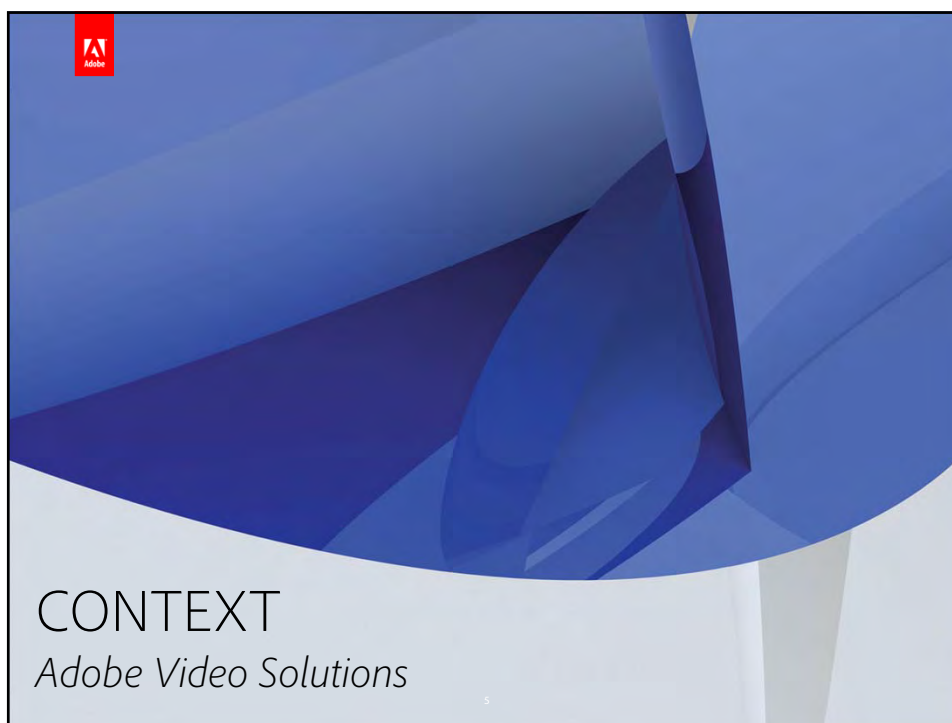
CONTENT CREATION	DELIVERY PROTECTION	EXPERIENCE DESIGN	MEASUREMENT, OPTIMIZATION ADVERTISING	MULTI-DEVICE MULTI-SCREEN
 Creative Suite 5.5  Adobe Media Encoder CSS5.5  Flash Media Live Encoder 3.2	 Adobe Flash Media Server  Adobe Flash Access DRM Adobe Pass for TVE	 open source media framework  FI  FB	 OMNITURE  auditude	 Flash Player AIR  HTML5  iOS  Android  BlackBerry  SAMSUNG

Breakdown

Today's 3 hour Agenda

UNE	DEUX	TROIS
CONTEXT 1:30p – 2:30p	STREAM 2:45p -3:30p	PROTECT 3:45p – 4:30p
Adobe Video Solutions Video Delivery Overview Flash Media Server 4.5 Content Protection options	Streaming Options Protocol Review HDS streaming HLS streaming Multicast + P2P delivery	Development Media Frameworks Protected HDS Protected HLS Protection Options Review
Demonstrations Production to Distribution Stream to Desktop Stream to Android / Blackberry Stream to IOS	Demonstrations M3u8 Variant Playlists (Apple) F4M Variant Playlists (Flash)	Demonstrations PHDS PHLS Summary Video Solutions Review What to expect from Adobe...

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Consistent video Experiences

- Live, VOD,
- H.264, AAC
- P2P, HTTP, RTMP
- Desktop, Mobile, TV

Dynamic Streaming

- Adaptive Bitrate
- Enhanced Seek, DVR

Protected delivery

- Encrypted protocol, SWF V

Video Performance

- Reduced Battery Consumption
- Optimized Encoding

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Consistent Video Experiences



iOS



BlackBerry

Flash Media Server 4.5 – What's New

Increased Reach at Lower Cost with Flash + iOS Delivery – deliver content to iPad and iPhone

- Deliver to Flash and iOS with the same media

Built-in Security Mechanisms Provide Ease of Deployment for Lower Protection Requirements

- Flash-enabled devices: Cacheable key delivery built on Flash Access client
 - Increased robustness over RTMPe
 - SWF Verification
 - No license server means no additional infrastructure
- iOS: Apple iOS encryption



Simplify Publishing Workflow, Reduce Storage Costs with Real-time HTTP Packaging

- Real-time HTTP packaging means no requirement to prepare content in advance

ADOBE FLASH MEDIA SERVER 4.5

SECURE VIDEO EXPERIENCES CONSISTENT ACROSS DEVICES

Media Delivery

Protected HTTP Streaming for Adobe Flash

HTTP protection built on Adobe Flash Access with no additional DRM license servers to add massive scale

Protected HTTP Streaming for Apple iOS

Use the same media and live streams you can deliver and protect full adaptive bitrate experiences to Adobe Flash Apple devices and HTML5 browsers.

Robust Media Origin services

Control your media publishing workflows, add redundancy, control access and protection, manage QoS

On-Demand stream packaging

Publish faster, reduce storage costs and save time by publishing video once with full adaptive bitrate support.

Communication

Scalable p2p introduction services for Adobe Flash

Increased capacity and fault-tolerance of your social or enterprise video and voice apps

Support for SIP-enabled devices

Integrate devices and conferencing technologies with a unified communication application using new SIP gateway services.



More Video to More devices --- Consistently

iOS



- HLS: HTML5 Browser
- HLS: AIR for IOS player
- HDS: OSMF 1.6
- HDS:
- Video Edit from Premiere

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DESKTOP



SMART TV



SMART PHONE / TABLET



SAMSUNG

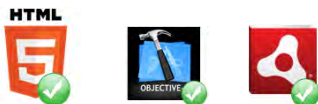
iOS



APPLE HLS STREAMING + PROTECTION

MPEG2-TS format (HLS)

- Video on Demand
- Live with DVR Time shifting
- Adaptive Bitrate
- Same Source MP4
- Content protection
- Variant playlist support
- In-Browser
- Native App or AIR for IOS



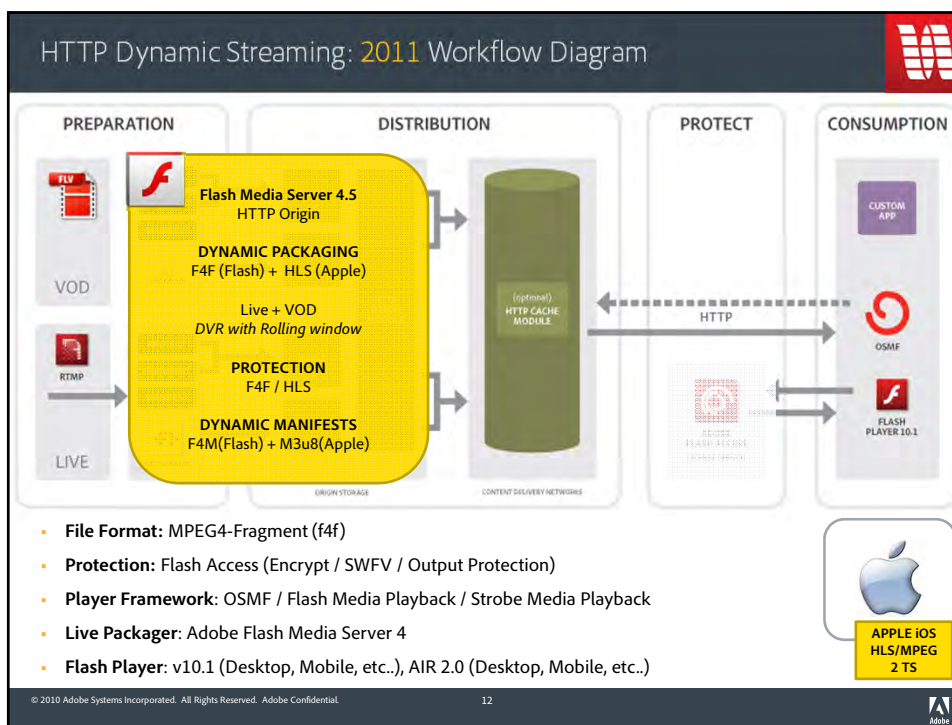
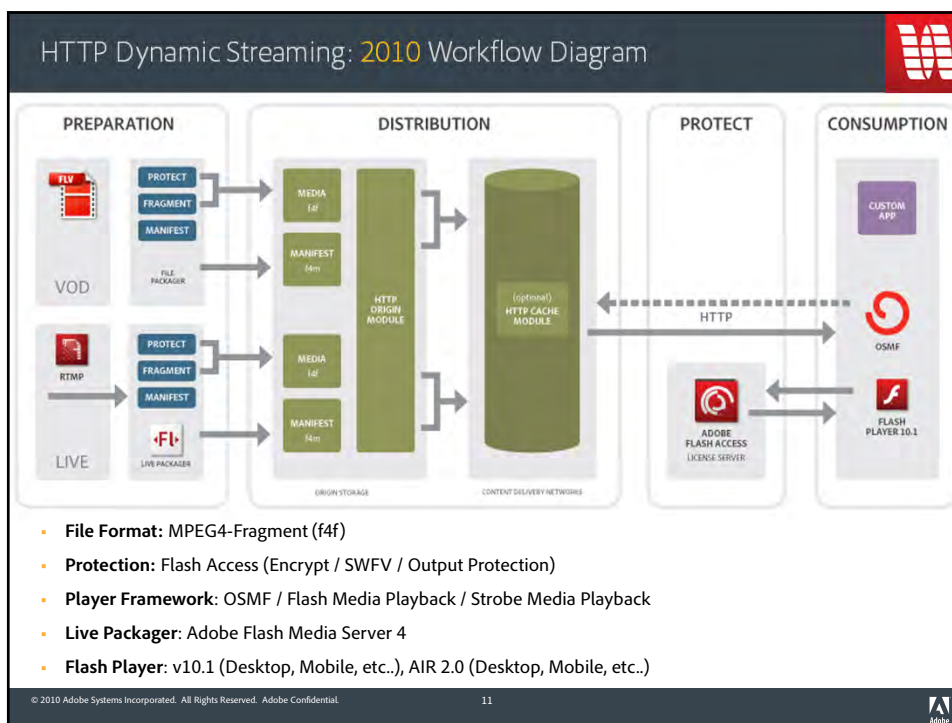
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Adaptive Bitrate for
Live and VOD
App Store Ready
Protected

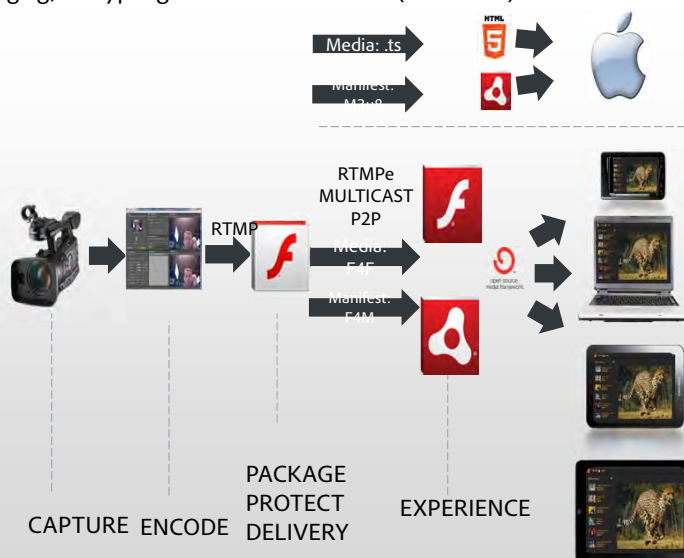




LIVE BROADCAST WORKFLOW

Live Broadcast from existing workflows using RTMP ingest

Unified Packaging, encrypting and manifest creation (.ts and .f4f)



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Adobe Flash Access 3

- Streaming or Download video
Multi-protocol (RTMP / HTTP)
- Flexible usage rules
Time-based, output protection
- Variety of business models
rental, subscription, electronic sell-through
- Cross-platform
*Windows, Mac, Linux, **Android***
- Playback in Flash Player 10.1 and Adobe AIR 2.0
desktop only in current version – mobile coming soon
- Approved by studios as part of DECE
Digital Entertainment Content Ecosystem



A content protection and monetization solution



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Flash Access 3.0 – What's New

Studio Approved Content Protection – Now on Mobile

- Android support today, more to come

Increased Efficiency for Massive Broadcast Scale

- Reduced operational cost with production efficiencies: pre-generate or embed licenses

**Ability to Support 24x7 Linear Content**

- Rotate keys for always-on content without updating content or license
- Increased scalability

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Content Protection Needs

Security + scalability
Linear (iptv), Video On Demand

Satellite, Cable, Linear
Distribution Provider

High

Strict security requirements
Subscription, rental

Online Distributors
Of Studio Content
think... Movies

Medium

Minimal/basic protection
Ad-funded video broadcast

Episodic, Live
Broadcasters
think... Sports, Concerts, News, Ad-supported

Low

No protection
UGC/promotional

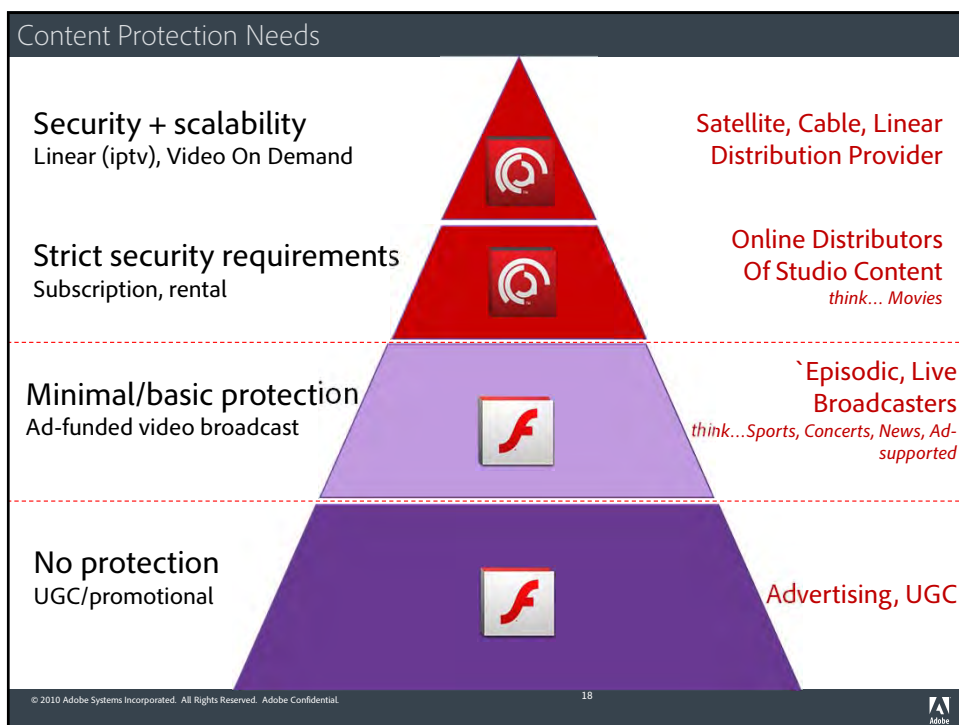
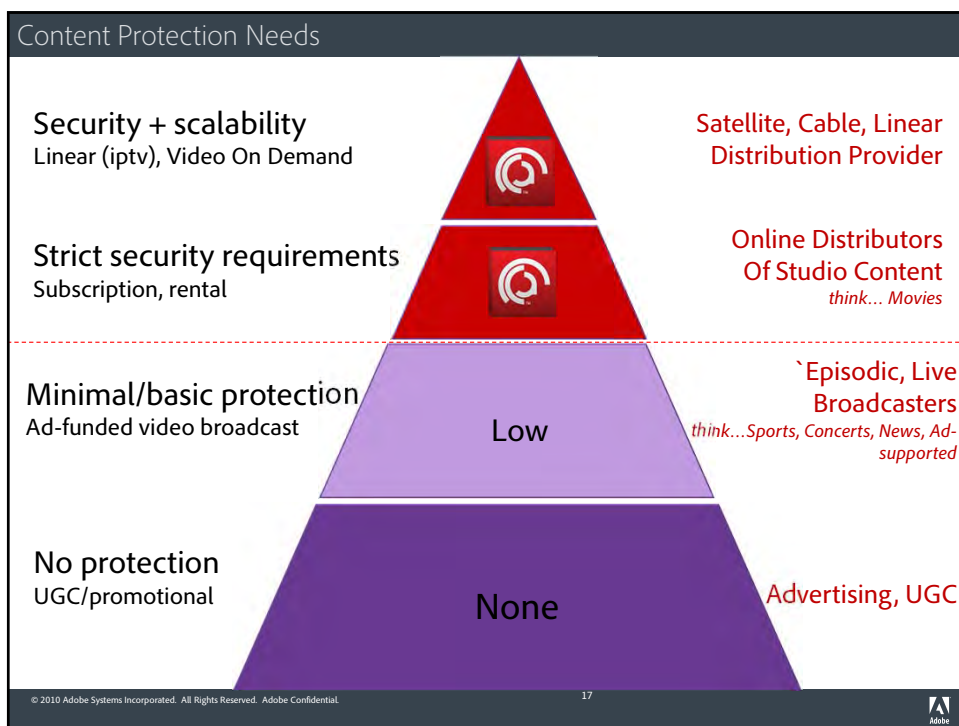
Advertising, UGC

None

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The right protection and workflow for the use case



ADOBE FLASH MEDIA SERVER 4.5

USE CASES

Protected HTTP Streaming (PHDS)

Ad-supported content

For publishers using RTMPe/SWFv today

TARGET

- Broadcaster
- live online publisher
- Enterprise streaming

FEATURE SET

- HLS/iOS encryption
- Cacheable Key Delivery
- Built on Flash Access client
- Increased robustness over RTMPe
- Asset/player binding (SWF Verification)
- No license server
- Simple configuration (per server, per asset)



ADOBE FLASH ACCESS 3

DRM



Premium Content delivery

Prevent content piracy / service cloning + enforce business models

- Online VOD publishers; IPTV
- Enterprise download & play

- DECE – Ultraviolet (UVVU) approved DRM
- Key Rotation (new!)
- License Chaining (new!)
- Domain support (new!)
- Output Protection for Device Filtering (new!)
- Offline Playback
- Advanced business rules
- Persistent encryption
- Asset/player binding (SWF Verification)
- Revocation and Renewability

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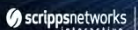
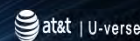
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Adobe Pass for TV Everywhere



Adobe Pass now supports top US
providers representing 90% of
pay TV households



Programmers & Publishers

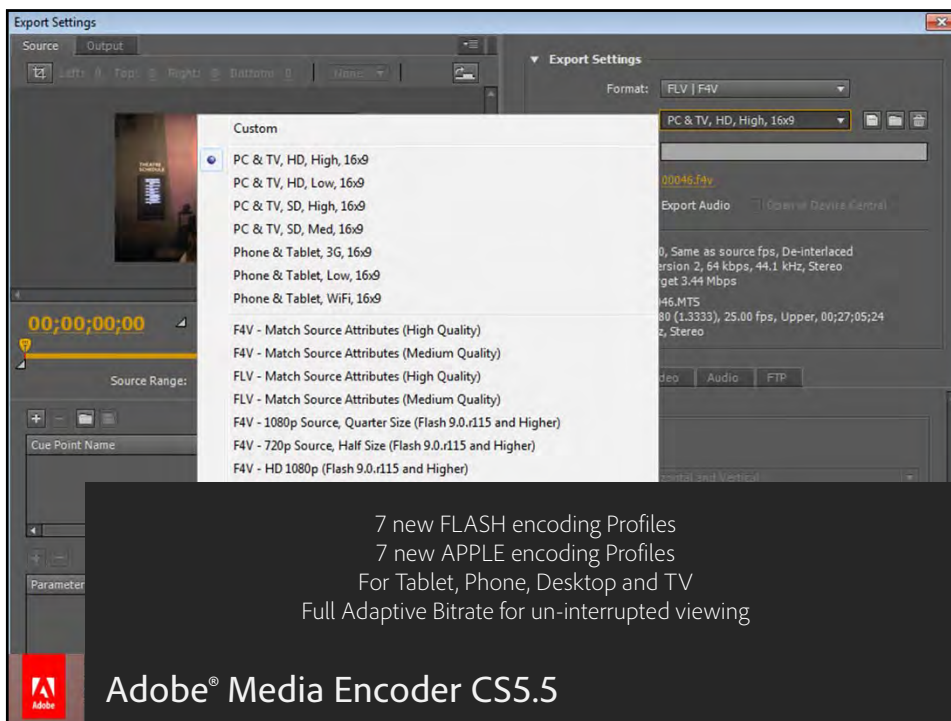
Connected Devices

Pay TV
Providers

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Export Settings

Source: [Video] Output: [Audio]

Format: FLV | F4V

PC & TV, HD, High, 16x9

PC & TV, HD, Low, 16x9

PC & TV, SD, High, 16x9

PC & TV, SD, Med, 16x9

Phone & Tablet, 3G, 16x9

Phone & Tablet, Low, 16x9

Phone & Tablet, WiFi, 16x9

F4V - Match Source Attributes (High Quality)

F4V - Match Source Attributes (Medium Quality)

FLV - Match Source Attributes (High Quality)

FLV - Match Source Attributes (Medium Quality)

F4V - 1080p Source, Quarter Size (Flash 9.0.r115 and Higher)

F4V - 720p Source, Half Size (Flash 9.0.r115 and Higher)

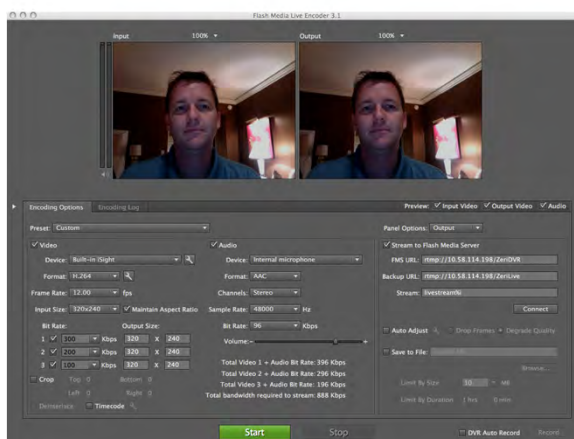
F4V - HD 1080p (Flash 9.0.r115 and Higher)


7 new FLASH encoding Profiles
7 new APPLE encoding Profiles
For Tablet, Phone, Desktop and TV
Full Adaptive Bitrate for un-interrupted viewing

Adobe® Media Encoder CS5.5

Flash Media Live Encoder

- Multi-bitrate support
- DVR/PVR Support
- H.264 + AAC support
- Local Archiving
- Auto Adjust (new for 3.1)
- Works on both PC and MAC
- 100% Free!






Get out your mobile device or desktop
Connect to WIFI SSID: **AdobeKT** WPA Pass: "**adobefms**"

Open your Web Browser (*yes – Apple Devices too*)
Browse to: **<http://192.168.1.250/sme/>**


DEMOS
Live Video Streaming

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Using Adobe Flash Media Server to Deliver Live and On-Demand Video
Kevin Towes, Senior Product Manager | November 2011





Breakdown


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Video Delivery Technology


Spelled out

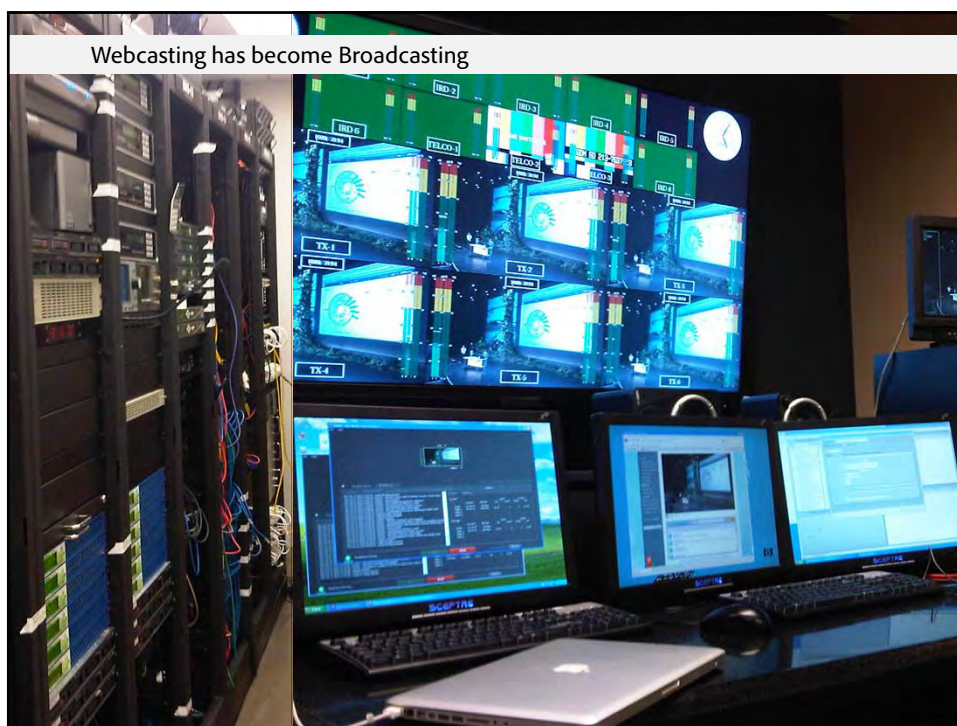


Technology	What it does
HTTP Dynamic Streaming (HDS)	Adaptive bitrate streaming (live+vod) over HTTP to Flash
(RTMP) Dynamic Streaming	Adaptive bitrate streaming (live+vod) over RTMP to Flash
RTMPe / SWF Verification	Content Protection for RTMP (in Flash Media Server)
DRM	Content Protection for HTTP (PDL + HDS)
Peer Assisted Networking	Enables Flash clients to assist in live video delivery (RTMFP)
Multicast	Hardware-assisted live video broadcasting
Multicast Fusion	Adobe's blending of IP Multicast and P2P
Flash Media Live Encoder	Live Encoding Software from Adobe
OSMF	Video player development framework
Flash Player and AIR	Client Runtime containing codecs, programing engine, protection

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How Far we've come...



1996 Live Broadcasts

- Tina Turner / CHUM Broadcasting (broadcasting at 12kbps)
- Juno Awards Online Backstage Production



Video is more than just playback

If we were just focused on Video playback – we would have been done many years ago.

(2002: Flash Player 6 and 7 introduced streaming + Progressive Delivery)

Adobe Innovations + standardization

- High quality Live
- Standard Video/Audio Codecs
- Standard Delivery protocols (RTMP / HTTP/P2P/Multicast)
- Real Time Protection – driving new revenue channels on Video
- High quality delivery – Multi-bitrate, Stream Reconnection,
- Bonus Features – DVR functionality, SMPTE timecode, multicamera
- Standard Video player Framework (OSMF)
- DRM



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Adobe Video Solution Providers

www.adobe.com/go/fmsp

- Content Delivery
 - Over 20 CDN's Worldwide
- Encoding
 - Over 15 partners worldwide
- Publishing
 - Over 17 partners worldwide
- Development
 - Over 10 partners worldwide
- Advertising
 - Over 10 partners worldwide



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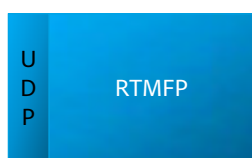


When to use HTTP Dynamic Streaming

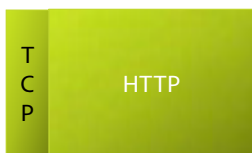


- Delivery cost reduction
- Utilize Internet caching infrastructure
- Easier firewall traversal
- Higher burstable capacity
- Utilize standard CDN load-balanced networks and HTTP infrastructure caching

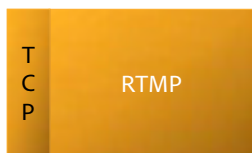
When to use What



- **"LIVE Enterprise + User Generated Content"**
- Lowest Deployment cost
- No CDN
- Easy Deployment + Protection workflow



- **"Big Broadcaster + Mobile"**
- Massive CDN Scale
- Increased Publishing workflow
- Requires Content Protection strategy



- **"Mid-size Broadcaster + Enterprise"**
- High quality of service
- Maximum reach
- Easiest Deployment + Protection workflow



Protocol Support with Flash Media Server versions				
		Flash Media Streaming Server	Flash Media Interactive Server	Flash Media Enterprise Server
UDP	RTMFP	IP Multicast		✓
		Unicast	✓	✓
		Peer Assisted	✓	✓
		Multicast Fusion	✓	✓
TCP	HTTP	Progressive Download	✓	✓
		HTTP Dynamic Streaming VOD	✓	✓
		HTTP Dynamic Streaming Live	✓	✓
		HLS Streaming for Apple	✓	✓
TCP	RTMP	RTMP	✓	✓
		RTMPE	✓	✓
		RTMPT	✓	✓
		RTMPS SSL	✓	✓

iOS

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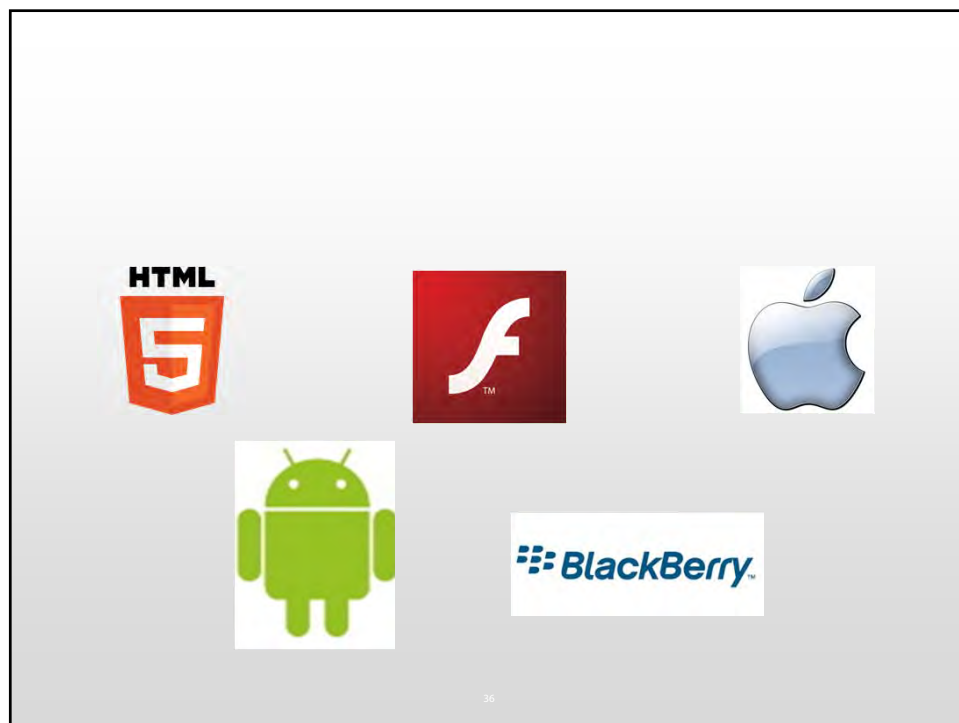


Broadcasters trust Adobe technology
to stream massive live events to the desktop



Standard Video Codecs: **H.264/AAC**
 Universal Content Protection: **(RTMPE/Flash Access)**
 Consistent Streaming: **RTMP, IP Multicast, P2P, HTTP**

 Video feature fragmentation: CODECS				
	Ogg	H.264	VP8	
	○		○	
	●		●	
	●		●	
	○		○	
	●		●	
Using Flash to reach multiple devices consistently				

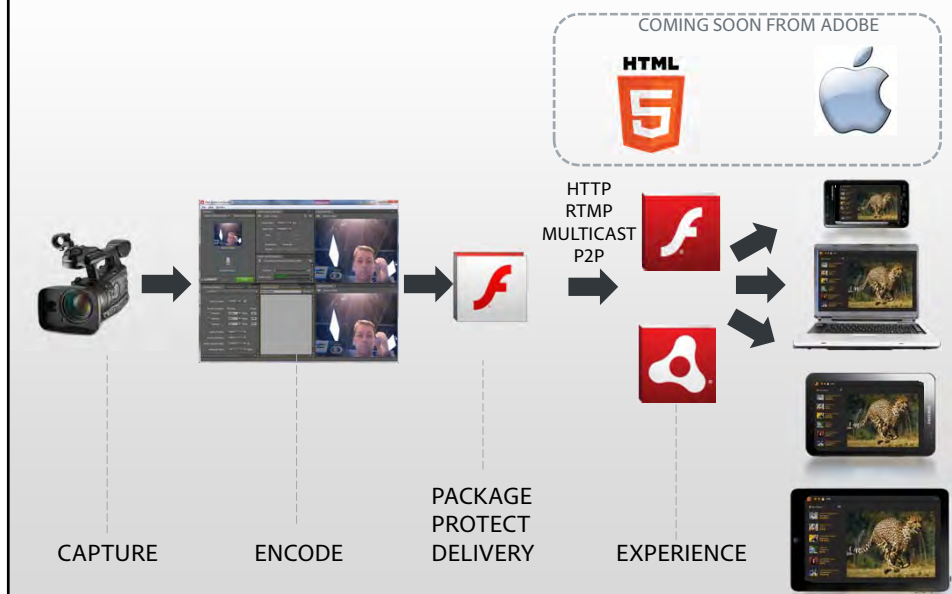


Broadcasters want to reach audiences
using multiple devices...



Live Streaming workflows are complicated
and expensive to manage!

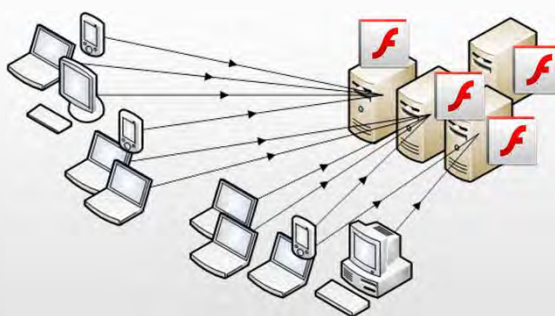
Simplifying online video broadcast workflows
to reach your entire audience potential



RTMP Streaming



Unicast to Flash using RTMP



Pros

- Multi-Bitrate (MBR)
- Seek/Pause/Resume
- Works for non multicast-capable clients

Cons

- Scaling tends toward expensive & difficult (possibly less so with HTTP)
- No hard latency bound under congestion (i.e. TCP retransmission)

RTMP Dynamic Streaming

- Simple Publishing workflows
 - Pre-Packaging - None
 - Pre-Encrypting - None
- Widest possible reach
- Excellent quality of service
 - Adaptive Bitrate
 - Enhanced Seeking
 - Reduced Disruption
- Lowest Latency
- Simple Scalability
 - Advanced Edge Cache management
- Real Time Data push
- Multi-way interactive



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RTMP has delivered the world's largest live events

- 2007 - Operation MySpace
- 2008 - Obama's US Presidential Inauguration
- 2009 - Michael Jackson funeral
- 2010 - FIFA World Cup
- 2011 - Royal Wedding, ESPN

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Multicast / Peer Assisted delivery



Multicast on the Adobe Flash Platform

UNICAST

Public & Internal streaming

- HTTP / RTMP Dynamic Streaming
- Maximum Reach
- Real Time protection
- Server/Client relationship
- RTMP Tunneling over HTTP

IP MULTICAST

Internal enterprise streaming

- UDP Broadcast
- Hardware-assisted
- No Server required
- Limited external reach

APPLICATION MULTICAST

Massive live delivery (public)

- Peer 2 Peer technology
- Flexible and massive scale
- No hardware requirements
- Low cost delivery
- Rendezvous servers required

ADOBE MULTICAST FUSION

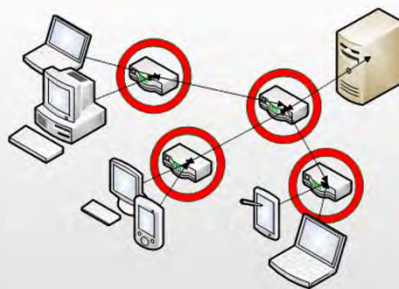
Internal enterprise streaming with Peer Assist

- Delivery higher quality of service
- Increase reach
- Hardware + software assisted
- Rendezvous servers required

IP Multicast

IP Multicast required Router Hardware support

Multicast from Adobe is Encrypted all the time



Pros

- High bitrate capabilities
- Low network impact
- Infrastructure Scaling

Cons

- Hardware Infrastructure requirements
- Limited QOS options
- No Seek/Pause/Resume

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Flash Media Server 4.5

Facts about RTMFP and Multicast



TRADITIONAL

ADOBE ADVANTAGE

IP Multicast

Multicast Fusion

- No end-user opt-in
- IPv4 and IPv6 multicast supported
- Any-source (traditional) multicast supported
- Source-specific multicast not (currently) supported
- Runnable in "serverless" mode

Enterprise friendly!

- Explicit opt-in to "peer assisted networking"
- No client "Supernodes" by design!

Requires RTMFP introducer

- FMS 4 or Adobe Cirrus @ labs.adobe.com

Bootstrapping to neighbors in Group can be

- Manual: adding peerIDs to group spec early, or adding to NetGroup at runtime
- Automatic: via LAN peer discovery - no introducer needed
- Automatic: via server channel to introducer

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Peer Assisted Networking

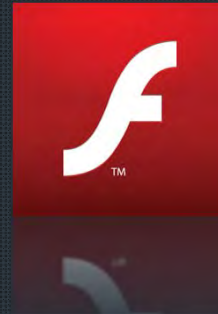
on the Adobe Flash Platform

Reduce Infrastructure costs

Reduce Bandwidth costs

Help enable new Social applications

Foundation for Massive media delivery



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A video player showing a man with glasses and a purple shirt speaking at a conference. The video player interface includes a volume icon, a progress bar, and a statistics box.

In: 314 Kbps	Out: 190 Kbps	Buffered: 4.0 secs
Estimated Members: 272.6	Current Neighbors: 30	

Adobe MAX 2010 Day 1 Keynote

Flash Media Server 4
with Peer Assisted Networking
Delivering a great experience
with no bandwidth costs

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Peer Assisted Networking Dialog

- appears after the client connects to the server, and enters a peer group
- Opt-in approach allows end-users to be aware that upload bandwidth will be used
- Your site is identified in the dialog
- Developers can have different responses depending on the user's response
- No way to disable this dialog

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Understanding P2P video delivery

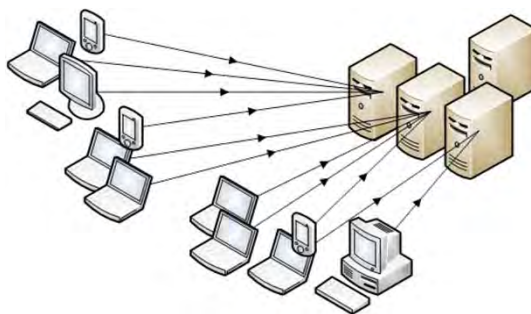
- **IN:** Current bitrate of the video
- **OUT:** Upload bandwidth being distributed
- **CURRENT NEIGHBORS:** Number of neighbors being served by you
- **BUFFERED:** amount of player video buffer
- **ESTIMATED MEMBERS:** number of P2P clients in the group

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The Multicast Advantage: Our Starting Point

- Unicast (client-server) with RTMP or HTTP



- Pros
 - Multi-Bitrate (MBR)
 - Seek/Pause/Resume
 - Works for non multicast-capable clients
- Cons
 - Scaling tends toward expensive & difficult (possibly less so with HTTP)
 - No hard latency bound under congestion (i.e. TCP retransmission)

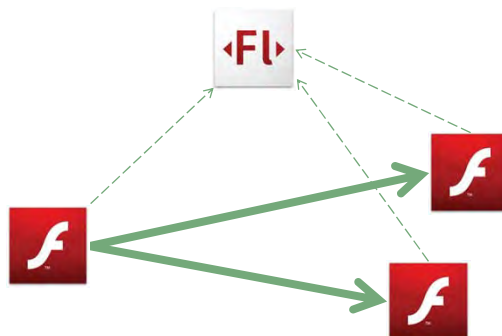
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Flash Player 10.0 (November 2008)

- Introduced in Flash Player 10 (November 2008)
 - Now at 95% penetration
- Allows data flow between Flash Players
- Managed P2P solution
- No network probing



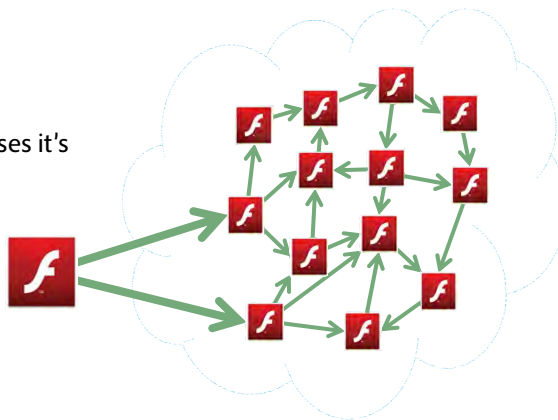
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Redefining the perception of P2P

- P2P can be good for the network
 - Reduce hardware costs
 - Access control
 - Media flow control
- Peer Assisted Networking uses it's neighbors to help distribute
 - Send media
 - Send data
 - Send messages



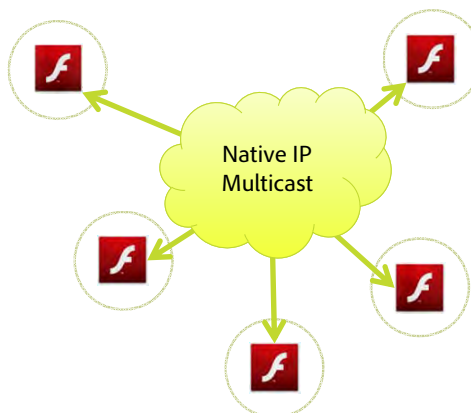
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IP Multicast

- IP Multicast leverages UDP network broadcasts to deliver content
- No server connection required
- Single copy of the stream passed through the network



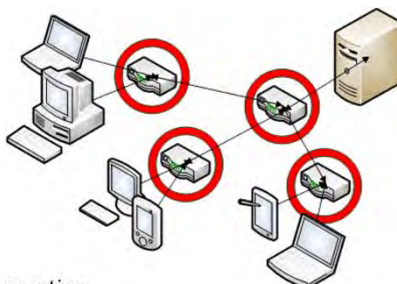
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The Multicast Advantage: Step 1

- Scale up using **IP multicast-enabled routers**



- Pros
 - Improved latency under congestion
 - Easy and cheap to scale! (from an FMS and bandwidth perspective)
- Cons
 - No MBR
 - No Seek/Pause/Resume

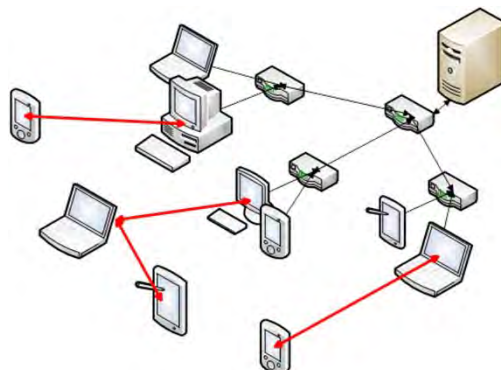
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The Multicast Advantage: Step 2

- Fusion** of IP multicast and P2P multicast!



- P2P mesh gets stream to clients not connected to multicast routers
- Similar pros/cons as IP multicast with improved reach but more potential latency in the P2P mesh

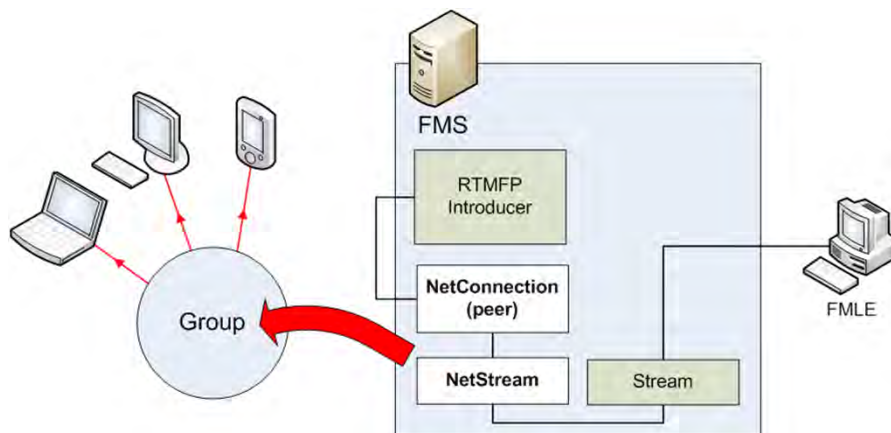
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FMS Multicast: 10K Foot View

- We're "relaying" a source Stream into a Group



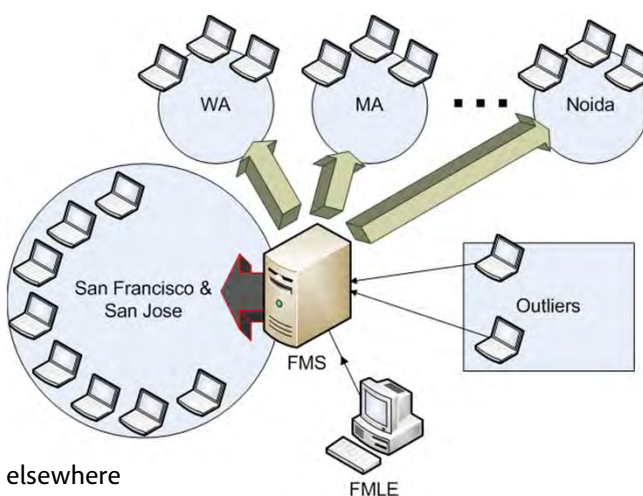
- Multicast sample app shipping in FMS 4 is a good starting point

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Deploying Multicast Fusion

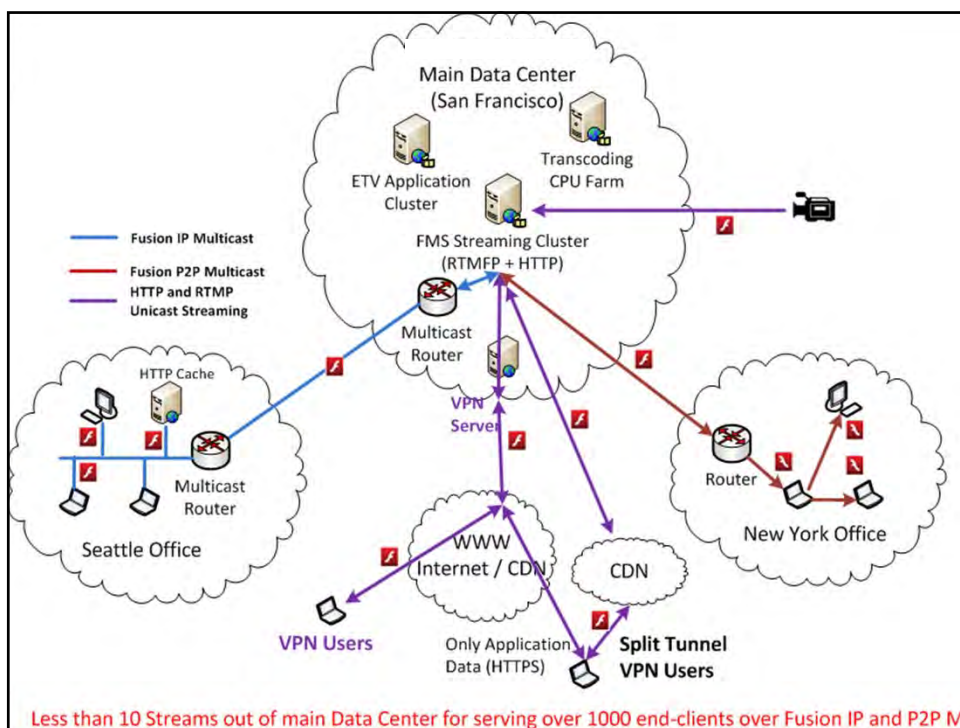


- Fusion in CA
- P2P multicast elsewhere
- Unicast for VPN and non-UDP users

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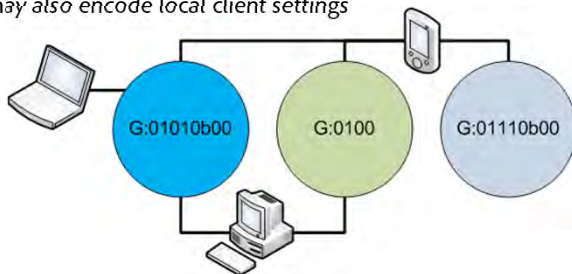
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Flash Groups: the Foundation for FMS Multicast

- Every Group is defined by name, capabilities and hashed passwords for any auth-limited capabilities
- Each multicast stream is scoped to a Group
- Clients use a "groupspec" to join a Group
- Example: "G:01010b...00..."
 - Canonical groupspec is the shared Group ID
 - Groupspec may also encode local client settings



HTTP Dynamic Streaming (HDS)



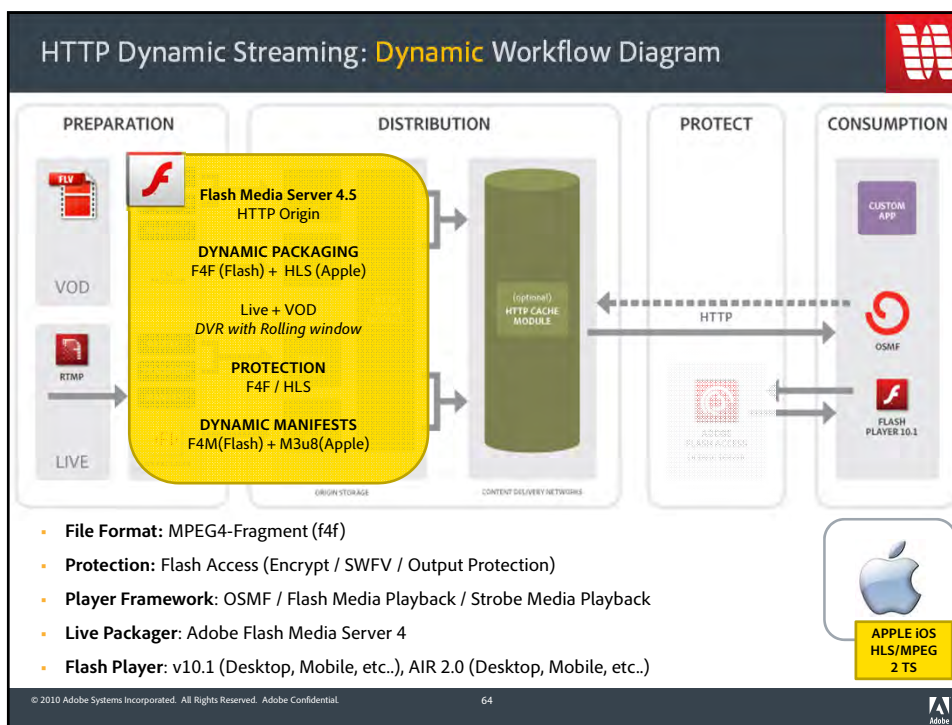
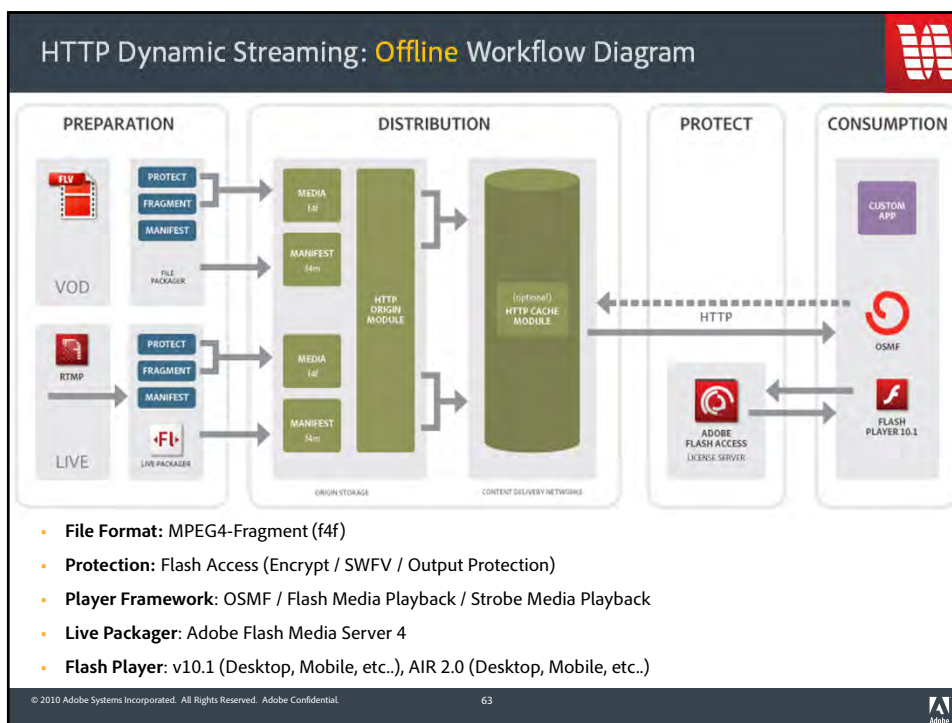
Increased capacity through caching
Improved Mobile experience

HTTP Dynamic Streaming



Replicated the Experience of RTMP

- Support for all Flash-enabled Codecs
- Standards-based MP4 Fragment format
- Cacheable Content
- Live DVR
- Adaptive Bitrate + Enhanced Seeking + Start Anywhere
- **Content Protection** powered by Flash Access
 - Continuous protection of content throughout the distribution chain
- Pre-built video player (OSMF)
 - for rapid custom video player development
 - easy integration with advertising and analytics
- Bitrate throttling to help ensure only what is watched is delivered



HTTP Live Streaming (HLS)



Options to Deliver to Apple Devices

Safari Browser



Create using HTML5
video tag

Live / VOD support

M3u8 Manifest

Adaptive Bitrate

Apps



Native App: Developed using Obj. C.

AIR for IOS App: Developed using Adobe tools
with Hardware Accelerated Video

Exactly the same experience

APPLE HLS STREAMING + PROTECTION

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Video on Demand

- Segmented in real time
- Same-Source (h264)
- Adaptive Bitrate

Live Streaming

- Source from RTMP
- Audio Extraction
- Timecode support
- DVR support with Rolling window

Protection

- AES-128bit encryption
- SSL Key Delivery
- Apple Device Binding

Playlist

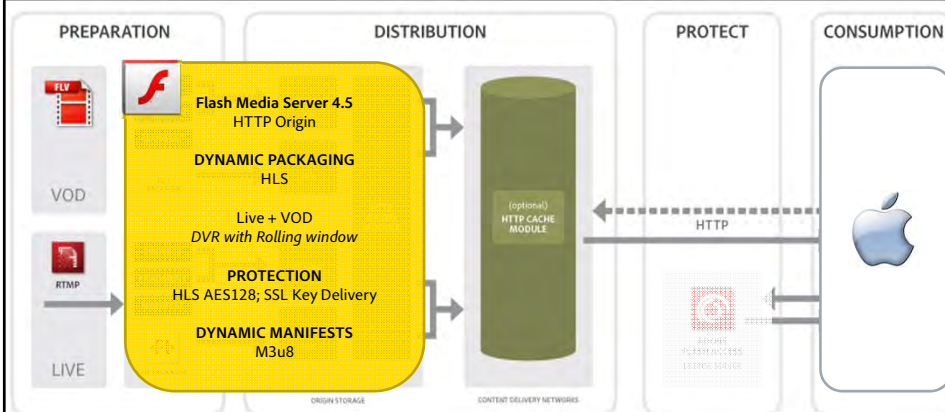
- Variant Playlist support



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HLS Streaming

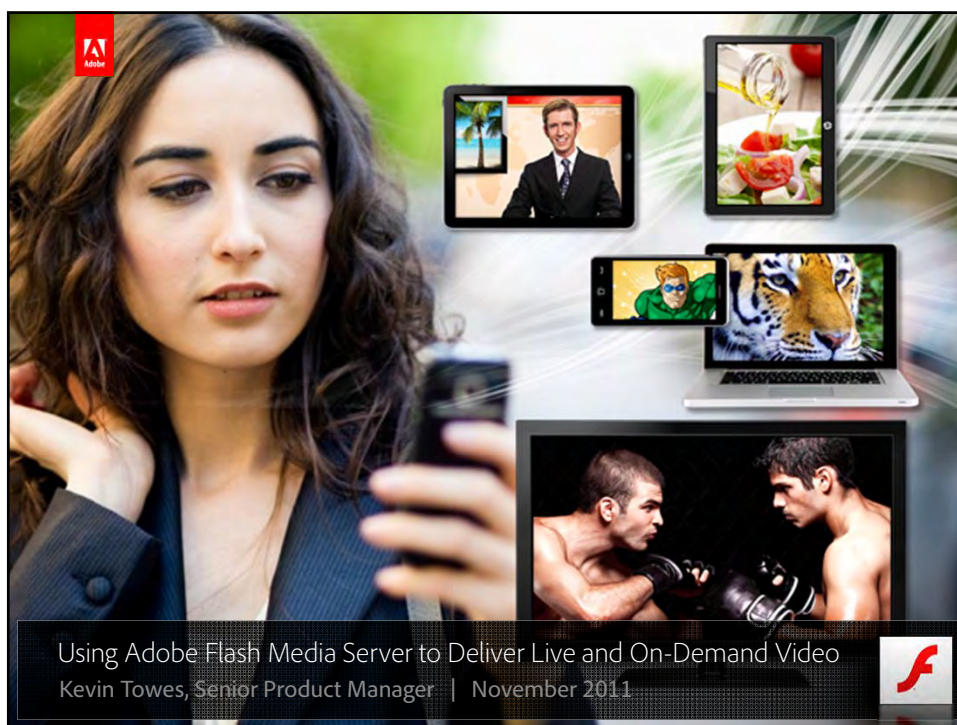
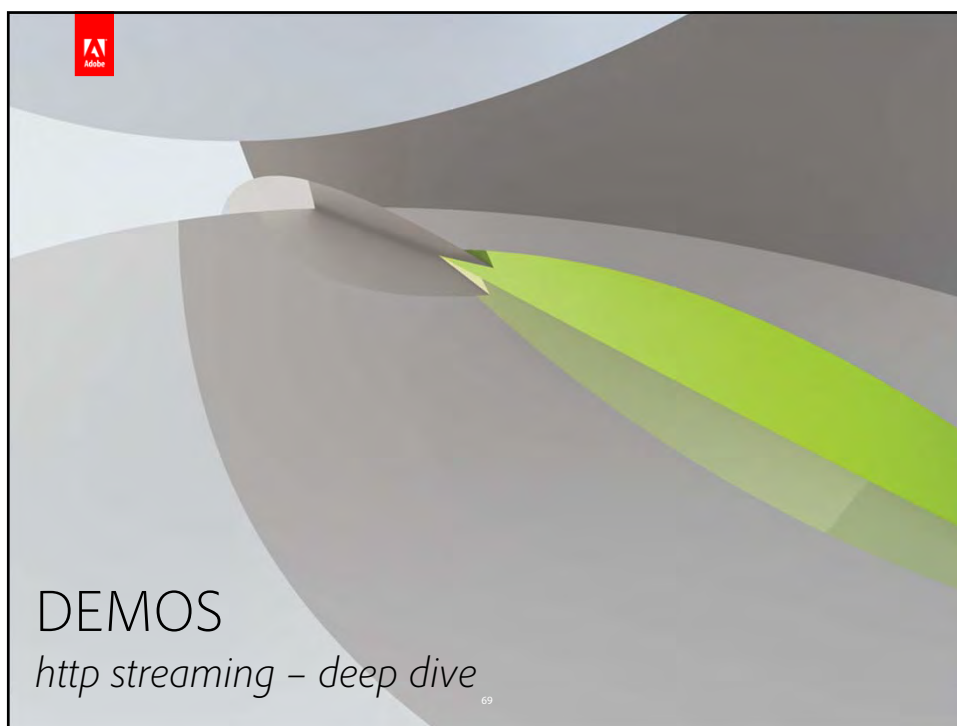





- **File Format:** MPEG2-TS (Apple HLS definition)
- **Protection:** AES-128 Bit Encryption – Key Delivery using SSL
- **Player Framework:** QuickTime foundation
- **VOD/Live Segmenter:** Adobe Flash Media Server 4.5
- **Flash Player:** Not required (note: AIR for IOS will consume HLS)

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 <h1>Breakdown</h1> <p>Today's 3 hour Agenda</p> 		
UNE	DEUX	TROIS
CONTEXT 1:30p – 2:30p	STREAM 2:45p -3:30p	PROTECT 3:45p – 4:30p
Adobe Video Solutions Video Delivery Overview Flash Media Server 4.5 Content Protection options	Streaming Options Protocol Review HDS streaming HLS streaming Multicast + P2P delivery	Development Media Frameworks Protected HDS Protected HLS Protection Options Review
Demonstrations Production to Distribution Stream to Desktop Stream to Android / Blackberry Stream to IOS	Demonstrations M3u8 Variant Playlists (Apple) F4M Variant Playlists (Flash)	Demonstrations PHDS PHLS Summary Video Solutions Review What to expect from Adobe...
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<small>71</small> 		



Open Source Media Framework (OSMF)

VIDEO PLAYER
DEVELOPMENT

- Simplifies the development of media players
- High quality, rich playback experiences
- Multi-protocol**
 - HTTP Dynamic Streaming
 - RTMP, RTMFP, Multicast, p2p
- Pluggable component architecture
- API integration
- Reporting and analytics
- Lowers development costs, facilitates faster turnaround
- Open framework facilitates collaborative development
- Benefits publishers, Adobe tool users, and ecosystem partners
- FREE




open source
media framework

www.OSMF.org

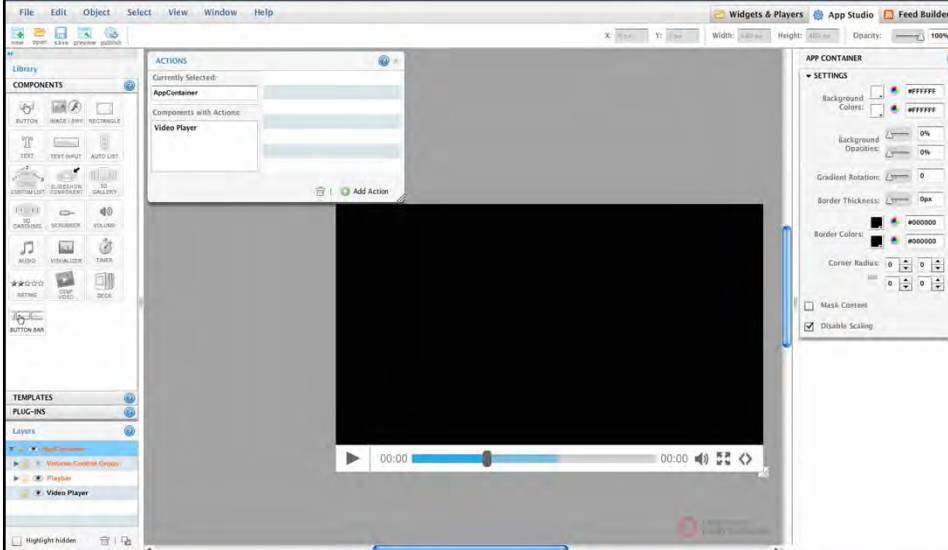
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OSMF App Studio by Kit Digital


<http://osmfappstudio.com>



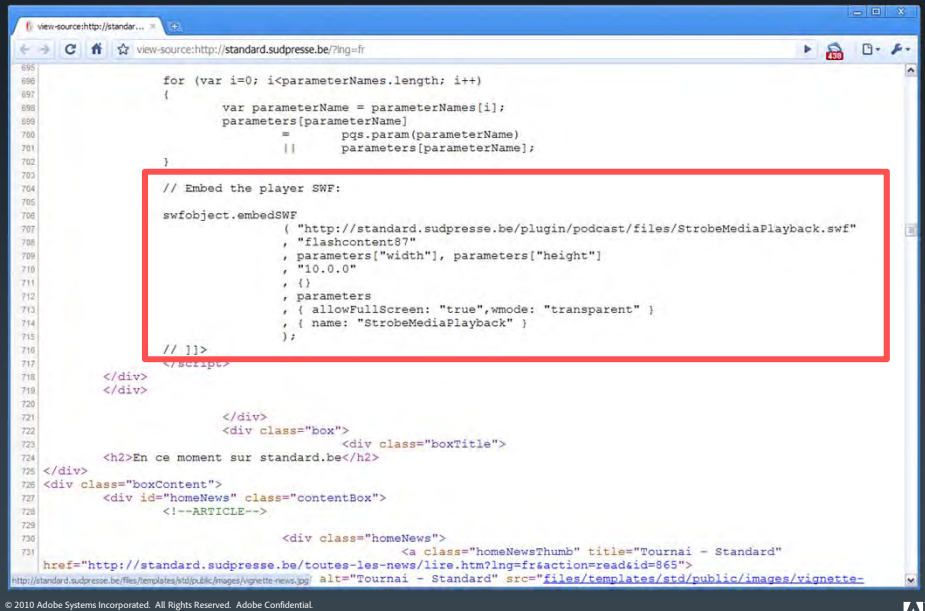
The screenshot shows the OSMF App Studio interface. It features a top menu bar (File, Edit, Object, Select, View, Window, Help) and a toolbar. On the left, there are panels for 'COMPONENTS' (listing various UI elements like buttons, text, video player) and 'TEMPLATES'. The main workspace displays a video player component with a timeline and playback controls. On the right, the 'APP CONTAINER' settings panel is visible, showing options for background colors, gradient rotation, border thickness, and corner radius. A 'Feeds Builder' tab is also present in the top right.

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Strobe Media Playback in action



```

695
696     for (var i=0; i<parameterNames.length; i++)
697     {
698         var parameterName = parameterNames[i];
699         parameters[parameterName]
700         = pqs.param(parameterName)
701         || parameters[parameterName];
702     }
703
704
705     // Embed the player SWF:
706     swfobject.embedSWF(
707         ( "http://standard.sudpresse.be/plugin/podcast/files/StrobeMediaPlayback.swf"
708         , "flashcontent87"
709         , parameters["width"], parameters["height"]
710         , "10.0.0"
711         , {}
712         , parameters
713         , { allowFullScreen: "true", wmode: "transparent" }
714         , { name: "StrobeMediaPlayback" }
715         );
716     // ]]>
717     </script>
718 </div>
719 </div>
720
721     </div>
722     <div class="box">
723         <div class="boxTitle">
724             <h2>En ce moment sur standard.be</h2>
725         </div>
726         <div class="boxContent">
727             <div id="homeNews" class="contentBox">
728                 <!--ARTICLE-->
729
730                 <div class="homeNews">
731                     <a class="homeNewsThumb" title="Tournai - Standard"
732 href="http://standard.sudpresse.be/toutes-les-news/lire.htm?lng=fr&action=read&id=865">
733 http://standard.sudpresse.be/files/templates/std/public/images/vignette-news.jpg alt="Tournai - Standard" src="files/templates/std/public/images/vignette-

```

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Manifests for HTTP delivery

Manifest files contain basic play information

- Adaptive Bitrate Profiles
- Source URLs
- Playlists
- DRM Protection
- Encoding details (i.e. H264) Profiles
- Encapsulation information (Fragment bootstrap or Segment URLs)

Generated and served to the Video Player BEFORE playback

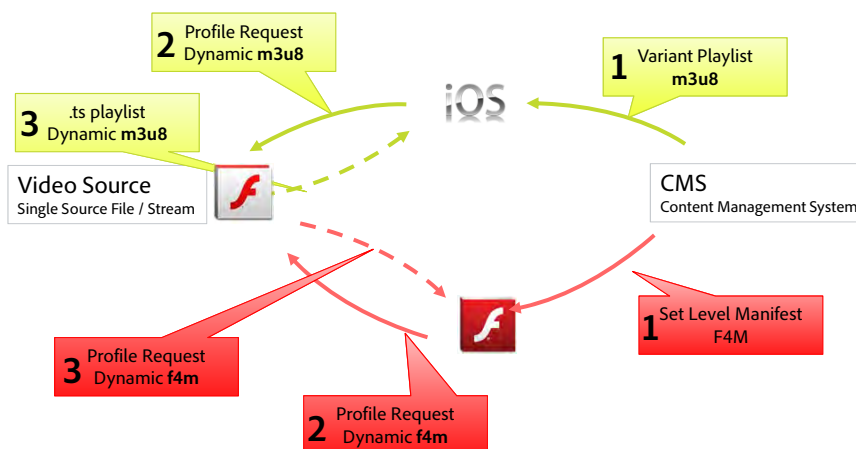
- Automatically by the CMS
- Targeted to Device
- Targeted to User

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Manifest files are the Key to HTTP Streaming



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Variant Playlist (M3u8) and Set level Manifest (F4M)

M3u8 variant playlist is a text-based description of the media set – designed for Apple iOS devices and QuickTime



```
#EXTM3U

#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=1250000
http://videodemo.kevintowes.ca/hls-vod/ipad_bridge_1250.mp4.m3u8

#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=950000
http://videodemo.kevintowes.ca/hls-vod/ipad_bridge_950.mp4.m3u8

#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=750000
http://videodemo.kevintowes.ca/hls-vod/ipad_bridge_750.mp4.m3u8

#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=600000
http://videodemo.kevintowes.ca/hls-vod/ipad_bridge_600.mp4.m3u8

#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=500000
http://videodemo.kevintowes.ca/hls-vod/ipad_bridge_500.mp4.m3u8
```

F4M set level manifest is an XML-based description for Flash / AIR



```
<manifest xmlns="http://ns.adobe.com/f4m/2.0">
  <media href="http://videodemo.kevintowes.ca/hds-vod/desktop_bridge_500.mp4.f4m" bitrate="500"/>
  <media href="http://videodemo.kevintowes.ca/hds-vod/desktop_bridge_900.mp4.f4m" bitrate="900"/>
  <media href="http://videodemo.kevintowes.ca/hds-vod/desktop_bridge_1250.mp4.f4m" bitrate="1250"/>
  <media href="http://videodemo.kevintowes.ca/hds-vod/desktop_bridge_1750.mp4.f4m" bitrate="1750"/>
  <media href="http://videodemo.kevintowes.ca/hds-vod/desktop_bridge_2500.mp4.f4m" bitrate="2500"/>
</manifest>
```

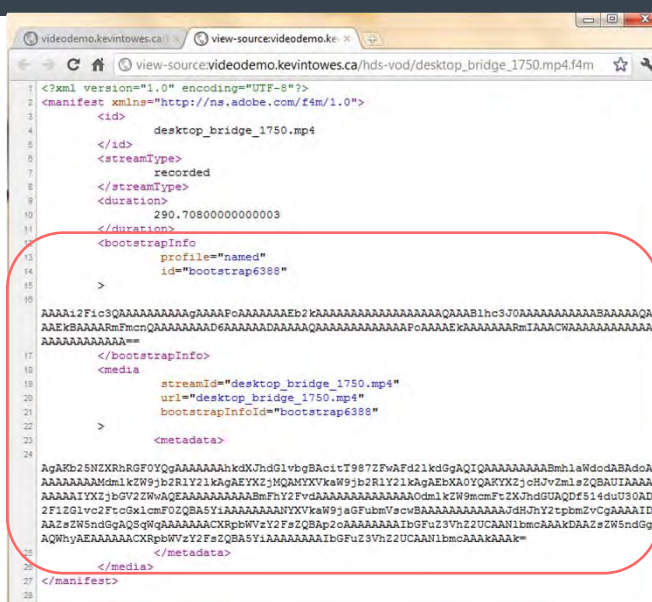
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F4M Manifest (Adobe Flash)

- Request will return information to the player
- **BootStrap**
Information – used to assemble the fragment requests
- **DRM Metadata**
- **VOD** – only 1 request
- **LIVE** – Request every 4 sec (relative to Fragment duration)



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M3U8 Manifest (Apple iOS)

- The variant playlist request will return information segment information to the player
- .ts information are the file requests by the player
- Operates like a play list
- VOD – file is fixed
- LIVE – file will grow

```

ipad_bridge_1250.mp4.m3u8 - Notepad
File Edit Format View Help
#EXTM3U
#EXT-X-MEDIA-SEQUENCE:0
#EXT-X-ALLOW-CACHE:NO
#EXT-X-VERSION:2
#EXT-X-TARGETDURATION:8
#EXTINF:8,
ipad_bridge_1250.mp4Frag1Num0.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag1Num1.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag2Num2.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag3Num3.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag4Num4.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag5Num5.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag6Num6.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag7Num7.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag8Num8.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag9Num9.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag10Num10.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag11Num11.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag12Num12.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag13Num13.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag14Num14.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag15Num15.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag16Num16.ts
#EXTINF:8,
ipad_bridge_1250.mp4Frag17Num17.ts
#EXTINF:8,

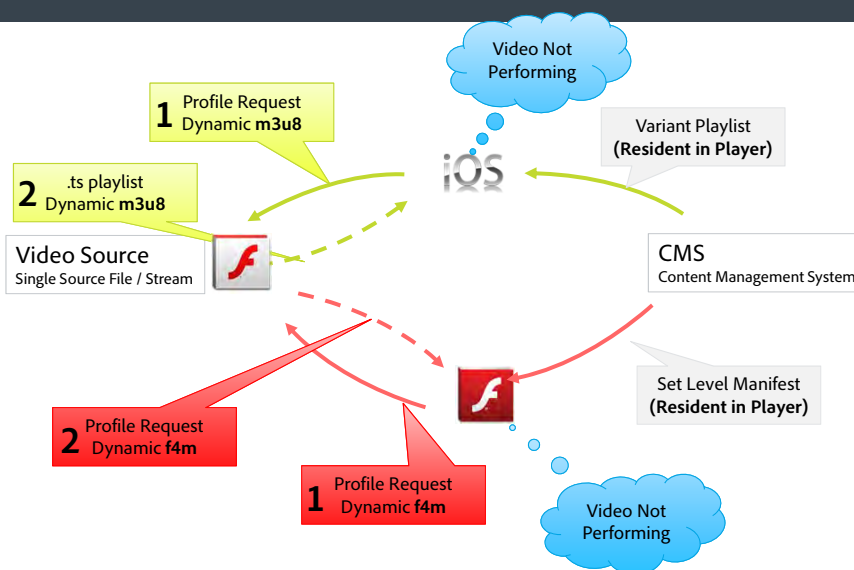
```

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Adaptive Bitrate switching



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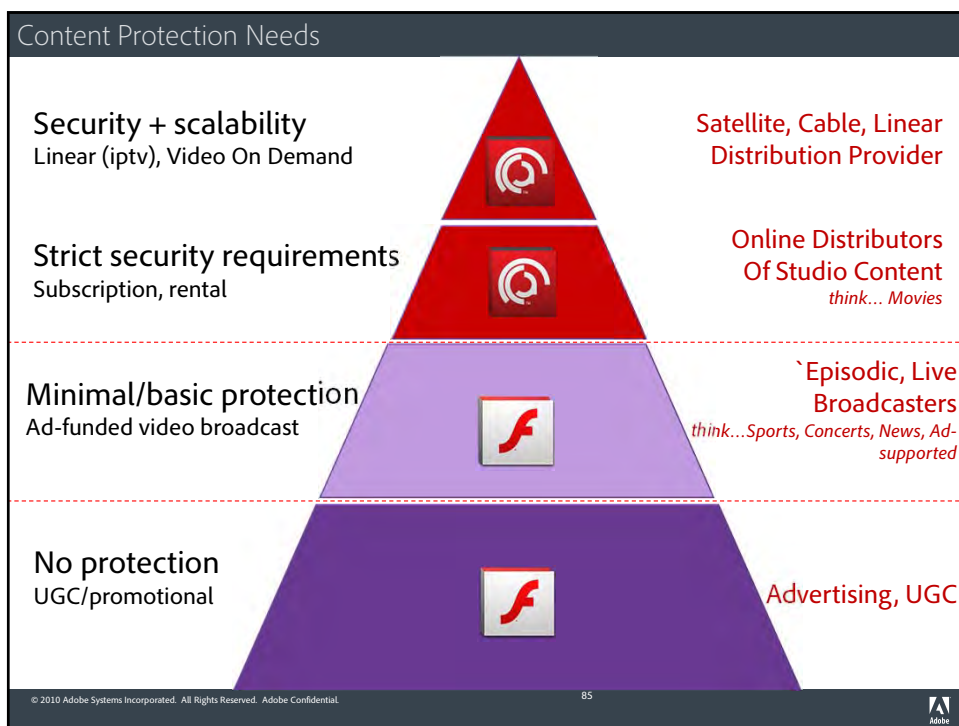
Adobe Manifest File Generator

- Easily create M3u8 and F4M variant playlists and manifests
- Ships with Flash Media Server 4.5
- Available on Adobe.com as a free download (coming soon!)

The screenshot shows the 'Set-level F4M/M3U8 File Generator' window. It has a red header with the Adobe logo and 'ADOBE FLASH MEDIA SERVER'. Below the header, there are two tabs: 'f4m' and 'm3u8'. The 'm3u8' tab is selected. The interface is divided into several sections:

- STREAM INFORMATION:** Contains a 'Stream URI:' text field, a 'Bitrate (kbps):' text field, and an 'Add' button.
- CODEC INFORMATION (N/A):** Contains 'Video:' and 'Audio:' dropdown menus.
- Base URI:** A text field with 'http://' entered.
- DVR Window Duration [s]:** A text field.
- Buttons:** 'View Manifest' and 'Save Manifest' buttons at the bottom.

The banner features the Adobe logo in the top left corner. The text 'Adobe.com' and 'Adobe Developer Connection' is displayed in the upper right. The main text 'CONTENT PROTECTION' is in large, bold, black letters, with the subtitle 'Protecting Content with PHDS and PHLS' below it. The background is a blue and white abstract design.



Configuring Flash Media Server for PHDS + PHLS

- Server is configured in 2 locations
 - For VOD: Apache Conf
 - For LIVE:
 - Apache Conf
 - FMS Config → Application.xml
 - FMS Conf → Event.xml
- Full Configuration Options

<http://adobe.ly/sHvPOr>

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Configuring VOD Protection

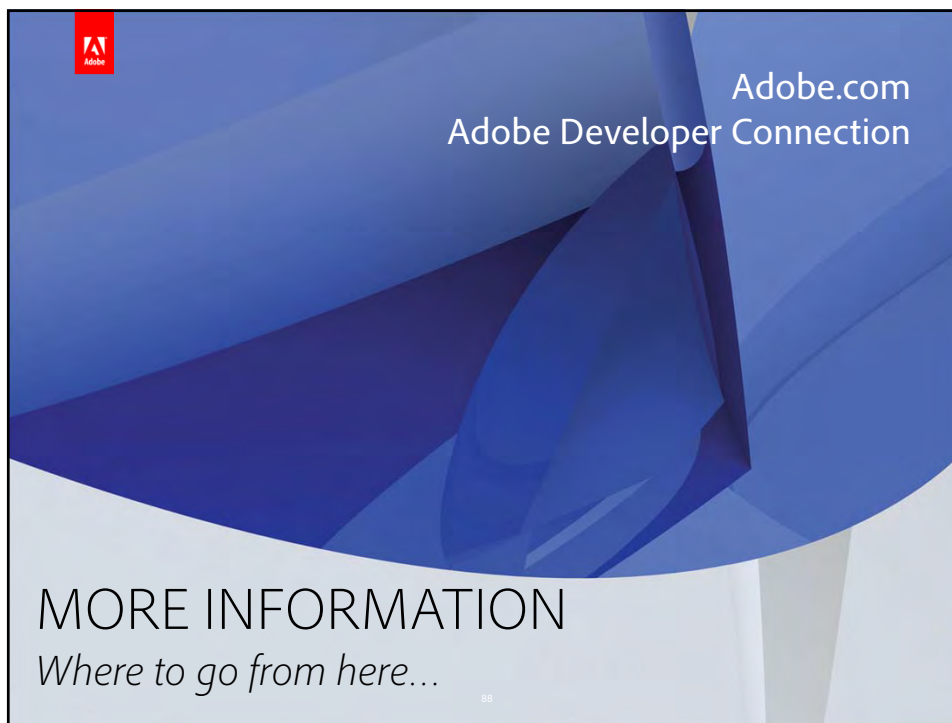
- Simple as enabling the feature
- Encryption Scopes: Server or Stream

```
<IfModule jithttp_module>
<Location /hds-vod>
    HttpStreamingJITPEnabled true
    HttpStreamingContentPath "../webroot/vod"
    JitFmsDirPath ".."
    Options -Indexes FollowSymLinks

    # Uncomment the following directives to enable encryption
    # for this location.
    EncryptionScope server
    ProtectionScheme phds
</Location>
</IfModule>
```

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Adobe.com
Adobe Developer Connection

MORE INFORMATION
Where to go from here...

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Lynda.com training

<http://bit.ly/fms4-5>

Free Video Tutorials on Adobe.com

Getting Started
<http://adobe.ly/uzwV2Z>

iOS Streaming
<http://adobe.ly/sCwUpt>

Adaptive Bitrate Streaming
<http://adobe.ly/sHCPvV>

<http://www.adobe.com/devnet/flashmediaserver.html>

Expert Series to get you started

Beginning Flash Media Server 4.5—Part 6: Beginner's guide to HTTP Dynamic Streaming (HDS)

by Tom Green

Requirements

Prerequisite knowledge	Required products	Sample files
Some previous experience working with Flash Media Server is recommended. Prior knowledge of web design concepts and using HTML to play Flash video online is helpful.	Flash Media Server (Download trial) Flash Professional CS5.5 (Download trial)	fms45_pt06.zip (ZIP, 29.4 MB)

User level: Beginning

Introduction

This article is the sixth in a series of beginning-level tutorials about Adobe Flash Media Server 4.5. This particular tutorial gets you started using Flash Media Server 4.5 to stream video over HTTP, rather than the RTMP standard used to this point in the series, and how to use both the HTTP and RTMP protocols to stream videos that target a device's bandwidth limitations using multi-bitrate manifest files.

Understanding HTTP Dynamic Streaming

In many respects, HTTP Dynamic Streaming (called HDS for the rest of this article) is Adobe's response to Apple's Adaptive Bitrate Streaming and Microsoft's IIS Smooth Streaming technologies. Common to all three is the ability to deliver media through HTTP Internet connections and deliver the media file best suited to the user's current bandwidth. An Android device has seriously less bandwidth available to it than a PC with an Ethernet cable plugged into it. The end result is smooth media playback on a multitude of devices ranging from smartphones to desktop computers.

Created: 24 October 2011

<http://adobe.ly/uh3LWJ>

More Information

CIRRUS

<http://labs.adobe.com/technologies/cirrus/>

FMS on AMAZON

▪ <http://www.adobe.com/go/fmsaws/>

Flash Media Enterprise Server 4

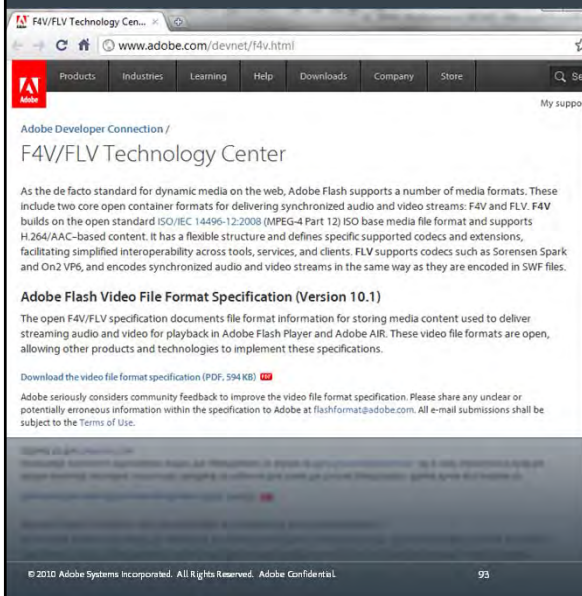
▪ <http://www.adobe.com/products/flashmediaenterprise/>

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F4F file format Spec: www.adobe.com/devnet/f4v.html

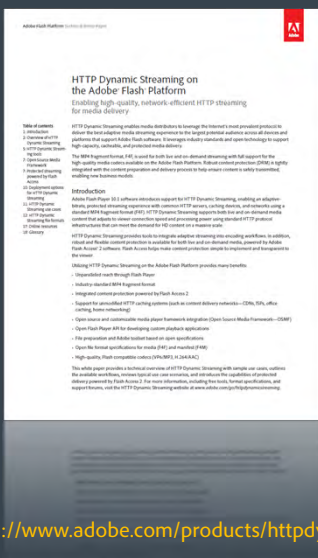


Full File format
details

DRM Metadata
Structure

Format options

HTTP Dynamic Streaming Whitepaper



18 Page technical overview

- Technical Details
- HTTP Dynamic Streaming Tools
- DRM + Protection
- Deployment Options
- Key Use Cases
- File Formats
- Online Resource Guide

http://www.adobe.com/products/httpdynamicstreaming/pdfs/httpdynamicstreaming_wp_ue.pdf





Adobe Flash Player

VIDEO
PLAYBACK

A Robust and secure media delivery platform

- HD video delivery with standard codecs
H.264/AAC
- Desktop + Mobile **Hardware Acceleration**
PC, MAC, Android, Blackberry
- Multiple streaming protocols
RTMP/e; HTTP Streaming; Peer Assisted Networking; IP Multicast
- Real Time Interactive experiences
video and audio capture (with Echo Cancellation)
- Robust and Simple Content Protection
Adobe Flash Access and RTMPE
- Live/VOD Adaptive Bitrate (HTTP and RTMP)
Adobe Flash Media Server



Flash Player 10.1

VIDEO
PLAYBACK

- Flash Player 10.1 allows your content to reach your customers wherever they are:
 - Desktops
 - Smartphones
 - Netbooks
 - Other Internet-connected devices
- Consistent and broadly adopted runtime
- Reuse code while adapting to individual device capabilities
 - GPU acceleration for video decoding and animation
 - Multi-touch gesture support
 - Accelerometer support
- Robust content protection powered by Flash Access 2.0
- HTTP Dynamic Streaming support



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Adobe AIR

VIDEO
PLAYBACK

- **Desktop applications**
- HTML/Javascript (AJAX), SWF content
- Cross-platform
- Repurpose existing content for online/offline delivery
- Play downloaded content protected with Flash Access (desktop only)



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Open Screen Project

VIDEO
PLAYBACK

- Built on the Flash Platform
 - Widest reach across operating systems and devices
 - A community of more than one million developers
 - Powerful, rich authoring tools

- Consistent runtime for standalone applications and web browsing

- Optimized for high performance on mobile screens
 - Leverages native device capabilities (contextual applications)
 - Availability expected in the first half of 2010

- Support for major device platforms:

- Android
 - BlackBerry® platform
 - Symbian® OS
 - Palm® webOS
 - Windows Mobile®

- Close to 70 ecosystem partners

- New partners include:

SYMBIAN

Disney Interactive Media Group

PBS

NBC UNIVERSAL

nick

open
screen
project

Singular experience, multiple devices

