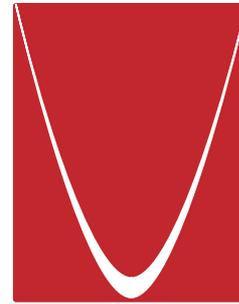# Training Presentation

Advanced Web Streaming

Introduction

- How is Web Streaming Evolving
- Who is Streaming?
- Types of Streams
- Streaming to Mobile Devices
- Monetizing Your Stream
- Copyright Issues
- How to Pick a CDN or OVP
- How to Integrate Cloud Services into Your Work Flow

The Evolution of Online Video

- Internet streaming began around 1993
- Early attempts weren't useful for the mass market
- 1996 Netshow Encoder (Microsoft) Released
- 1997 Real Networks took advantage of technology and became market leader
- 1998 Sorenson released an advanced CODEC that made low bandwidth applications possible
- 2000 Flash begins dominant run as Real declines
- 2001 NewTek introduces VT[2], which streams
- 2005 NewTek introduces TriCaster
- 2007 Flash Media Live Encoder released

Who Is Streaming?

▸ Everyone who wants to make money, expand their business or save money.
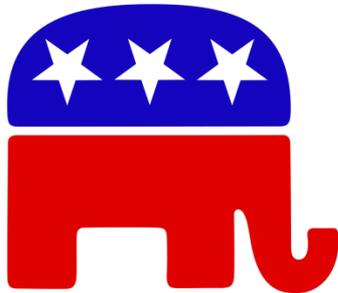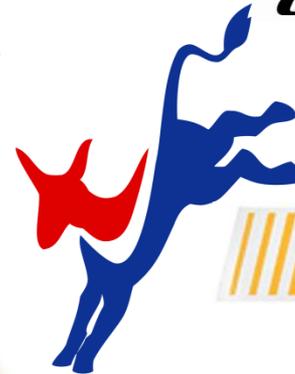
Your Competitors

Types of Streams

- Live
- Video On Demand (VOD)
- Push
  - Flash
  - Windows Media
  - Real
  - HTTP
    - Silverlight Smooth Streaming
    - Apple HTTP live streaming
    - Adobe Dynamic Streaming
- Pull
  - Windows Media
  - Progressive Download (Not Really Streaming)

Popular Protocols

▸ H. 264 (best quality for the bit rate)

▸ WebM not common, but challenges H. 264

▸ VP6

▸ VP8

▸ MOV (Wrapper)

▸ AVI (Wrapper)

▸ FLV (Wrapper)

▸ F4V (Wrapper)

▸ Microsoft Word is like the container. Language written in the text is like the CODEC.

Stream or Die

▸ Video is the most effective way to build traffic to your website

▸ Website visitors stay longer when you have video

▸ Video is a gateway to higher purchases and online charitable donations

▸ Improve brand awareness and reinforce messaging.

▸ Provide training at a fraction of traditional cost

▸ Make your marketing global

▸ Broadcast any event with no gatekeeper.

Web Streaming Pros and Cons

▸ **Great things about web streaming**

  ▸ You can reach a lot of people anywhere

  ▸ Can be free with advertising

  ▸ Can make money through advertising or VOD

  ▸ Powerful way to build a brand

  ▸ Save money on travel and venue

  ▸ Can be performed from multiple devices

▸ **Not-so-great things about web streaming**

  ▸ Expensive if not ad supported

  ▸ Can be complicated to set up

  ▸ Requires a fast and reliable Internet connection

  ▸ It's not two-way

Streaming to Mobile Devices

▸ Why stream to mobile devices?
  ▸ Smart phone and tablet use increasing
  ▸ Mobile networks getting faster
  ▸ Young people adopting mobile broadband
  ▸ Minority use of Internet highest on mobile devices

▸ Mobile devices have particular streaming requirements
  ▸ The are relatively low bandwidth
  ▸ The have limited processing capability
  ▸ Screens are small and of varying sizes and resolutions

▸ Most mobile devices handle a stream designed for a desktop just fine.

▸ Streaming to iOS devices have been problematic

Streaming to iOS Devices (iPhone/iPad)

▶ iOS devices require hypertext transmission protocol (http) streaming

  ▶ Darwin Server: http live streaming (HLS)

  ▶ Adobe Dynamic Streaming

  ▶ Microsoft Smooth Streaming

▶ Adobe recently released a server that fully supports HLS

▶ Wowza has a competing product that has supported HLS for some time

▶ Adobe and Wowza are in a patent dispute

▶ Microsoft Silverlight can stream to iOS as well

▶ Key is fragmented files, H. 264 and AAC Codecs.

Streaming to iOS Devices – Take Home

‣ Preparing Media for Delivery to iOS-Based Devices

‣ The recommended encoder settings for streams used with iOS-based devices are shown in the following four tables. For live streams, these settings should be available from your hardware or software encoder. If you are re-encoding from a master file for video on demand, you can use a video editing tool such as Compressor or Sorenson Squeeze.

‣ File format for the file segmenter can be a QuickTime movie, MPEG-4 video, or MP3 audio, using the specified encoding.

‣ Stream format for the stream segmenter must be MPEG elementary audio and video streams, wrapped in an MPEG-2 transport stream, and using the following encoding.

‣ Encode video using H.264 compression

  ‣ iPhone 3G and later, and iPod touch, 2nd generation and later, support H.264 Baseline 3.1. If your app runs on older versions of iPhone or iPod touch, however, you should use H.264 Baseline 3.0 for compatibility.

  ‣ For iPad, Apple TV 2 and later, and iPhone 4 and later, you can use Baseline profile 3.0, Baseline profile 3.1, or Main profile 3.1.

‣ **Note:** Baseline profiles are not the same as Main profiles. iPhone and iPod touch use Baseline profiles. iPad and Apple TV can use Baseline or Main profiles. Use Main profiles if your content is for large-screen devices only; use Baseline profiles if your content is meant to be viewed on small screens only, or on both large and small screens.

‣ A frame rate of 10 fps is recommended for video streams under 200 kbps. For video streams under 300 kbps, a frame rate of 12 to 15 fps is recommended. For all other streams, a frame rate of 29.97 is recommended.

‣ Encode audio as either of the following:

  ‣ HE-AAC or AAC-LC, stereo

  ‣ MP3 (MPEG-1 Audio Layer 3), stereo

‣ Audio sample rate of 22.05 kHz and audio bit rate of 40 kbps is recommended in all cases.

Encoder settings for iPhone, iPod touch, iPad, and Apple TV, 16:9 aspect ratio

Connection	Dimensions	Total bit rate	Video bit rate	Keyframes
Cellular	480 x 320	64 kpbs	audio only	none
Cellular	480 x 224	150 kpbs	110 kbps	30
Cellular	480 x 224	240 kpbs	200 kbps	45
Cellular	480 x 224	440 kpbs	400 kbps	90
WiFi	640 x 360	640 kpbs	600 kbps	90

Additional encoder settings for iPad and Apple TV only, 16:9 aspect ratio

Connection	Dimensions	Total bit rate	Video bit rate	Keyframes
WiFi	640 x 360	1240 kpbs	1200 kbps	90
WiFi	960 x 540	1840 kpbs	1800 kbps	90
WiFi	1280 x 720	2540 kpbs	1500 kbps	90
WiFi	1280 x 720	4540 kpbs	4500 kbps	90

Encoder settings for iPhone, iPod touch, iPad, and Apple TV, 4:3 aspect ratio

Connection	Dimensions	Total bit rate	Video bit rate	Keyframes
Cellular	480 x 320	64 kpbs	audio only	none
Cellular	480 x 300	150 kpbs	110 kbps	30
Cellular	480 x 300	240 kpbs	200 kbps	45
Cellular	480 x 300	440 kpbs	400 kbps	90
WiFi	640 x 480	640 kpbs	600 kbps	90

Additional encoder settings for iPad and Apple TV only, 4:3 aspect ratio

Connection	Dimensions	Total bit rate	Video bit rate	Keyframes
WiFi	640 x 480	1240 kpbs	1200 kbps	90
WiFi	960 x 720	1840 kpbs	1800 kbps	90
WiFi	960 x 720	2540 kpbs	2500 kbps	90
WiFi	1280 x 960	4540 kpbs	4500 kbps	90

Web Stream Process

- Acquire

- Encode

- Transmit

- Distribute
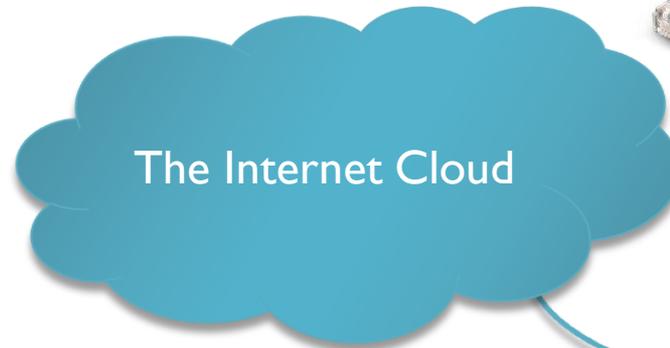
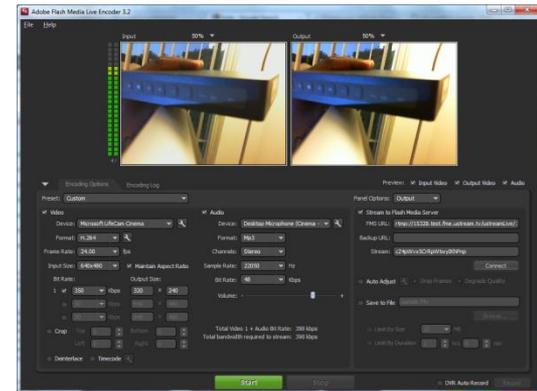- Decode

The Internet Cloud

Acquire

▸ Garbage In Garbage Out

Encode

▸ Decision to make: Hardware or Software?

▸ What's your budget?

▸ What do you have already?

▸ Who will receive your stream?

Transmit

▸ Getting your stream to the Internet can be simple…

▸ … or very difficult.

▸ Firewalls can be a problem in hotels

▸ Make sure you have adequate bandwidth

▸ Have a reliable signal. DO NOT RELY ON WIFI!

▸ Use a hardwired connection where at all possible

▸ Test before, during, and after your stream

▸ Special circumstances for wireless:

   ▸ Bonded Cellular

   ▸ Satellite

   ▸ 4G LTE

1935

▸ Why is this number important?

   ▸ A) It was the year Sandy Audio Visual's founder was born
   ▸ B) It was the beginning of the end of a fanatical regime
   ▸ C) It's the port you have to open so Flash content can pass through
   ▸ D) All of the above.

Distribute

- Ideally, use a content delivery network (CDN)
  - A CDN takes your stream and redistributes it to many
  - A CDN can be free with ads or paid with no ads
  - An advanced CDN is called an Online Video Platform (OVP)
- You can stream directly from your encoder **IF**
  - You are simply going point-to-point
  - You have very few viewers
  - You have ample bandwidth
  - You're feeling lucky.

Monetizing Your Stream

- How do you make money from your stream?
- The video itself can bring in money by advertising your product.
  - Or it supports the advertisements of others;
  - is viewed only after payment has been made.
  - is part of a sponsorship package
  - is a component of a paid package.
- Your video saves money by virtually expanding a venue or reducing travel costs.
- Not-for-profits: link to your donation or online giving page.

Monetizing Your Stream

▸ YouTube Partnership (share ad revenue)

▸ Longtail Ad Network

▸ Online Video Provider Ad Network

  ▸ Livestream.com

  ▸ Brightcove.com

  ▸ List books, articles, and electronic sources

▸ Go it alone

  ▸ Google adWords

  ▸ Yahoo Ads

  ▸ Seek individual sponsors for your stream.

Copyright Issues ©

▸ Only stream content that belongs to you or your client

▸ Make sure you have a "hold harmless" clause in any agreement you have with your client

▸ You can purchase the right to use content through a license

▸ Licenses to stream audio content can be obtained from publishing rights organizations

▸ Be careful of blanket licenses

WorshipCast Licence

▸ Normally, churches are exempt from performance royalties

▸ Exemption does not qualify for web streaming

▸ WorshipCast covers streaming of all ASCAP, BMI, and SECAM titles, religious and secular (16M Songs)

▸ WorshipCast license costs $500 for small congregations <500 and $925 for congregations =<500

▸ You can charge people for your webcast, unlike CCLI if you make <$13,000/yr from VOD

▸ You are not allowed to Podcast (have the content available for download later)

CCLI License

- Christian Copyright Licensing International (CCLI) offers a catalog of inspirational and worship songs

- Catalog is about 200,000 songs

- Webcasting license between $50 - $750

- Requires regular CCLI license between $52 - $4685

- You can not charge people to view your content

- You can podcast the content (make it available for viewing later)

- License is limited to worship services

License Pricing

Category	Church Size	Annual Fee
AH	1-24	$50
A	25-99	$50
B	100-199	$50
C	200-499	$75
D	500-999	$100
E	1,000-1,499	$150
F	1,500-2,999	$200
G	3,000-4,999	$250
H	5,000-9,999	$300
I	10,000-19,999	$400
J	20,000-49,999	$500
K	50,000-99,999	$750

Church size based on regular attendance at the main service(s). If multiple services, use combined attendance.

The Church Copyright License Annual Fee - U.S.

Category	Church Size	Annual Fee
AH	1-24	$52
A	25-99	$109
B	100-199	$185
C	200-499	$245
D	500-999	$345
E	1,000-1,499	$420
F	1,500-2,999	$505
G	3,000-4,999	$570
H	5,000-9,999	$720
I	10,000-19,999	$865
J	20,000-49,999	$1150
K	50,000-99,999	$1725
L	100,000-199,999	$2910
M	200,000 +	$4685

The Church Copyright License is an annual license. All terms are in effect only while the license is active. If the license is not renewed, all rights are terminated effective on the expiration date.

The quantity of copies allowed should not exceed the number of your "Church Size" category, with the exception that the quantity of recordings duplicated per service should not exceed 15% of the "Church Size" category.

Yet More Copyright

▸ DON'T WEBCAST LYRICS! Unless you have the author's consent

▸ Don't play prerecorded music, unless you have gained the publisher's permission

▸ Other Licenses For Specific Needs

  ▸ **Event License** is a seven-day license available for special events such as conferences, crusades, city-wide meetings or camp meetings.

  ▸ **Mobile License** is designed for traveling ministries or individuals who use the license in more than one location.

  ▸ **Video License** to web stream certain (i.e. non-Hollywood) video content – see CVLI

How To Pick a Content Delivery Network

▸ Determine what features you want

- ▸ iOS support
- ▸ Live recording
- ▸ Interactivity
- ▸ Security
- ▸ Stream quality
- ▸ Scalability
- ▸ Advertising

▸ Find CDNs that have those features

▸ Pick the best price.

Exploiting the Cloud

- Cloud encoding and transcoding
  - Sorenson 360
- Cloud storage
  - Amazon S3
  - Vimeo
  - YouTube
  - SAV
- Cloud delivery
  - Amazon Web Services
    - Adobe Flash Media Server
   - Wowza Media Server
  - Akamai

Summary

▸ Quality In; Quality Out – Acquire the best possible content.

▸ Get the best encoder you can afford.

▸ Make sure you have a rock solid Internet connection.

▸ Plan ahead to best meet your distribution needs.

▸ Remember your content will be viewed on a variety of platforms.

▸ Hire a consultant before your get stuck – it's cheaper

▸ Decide if the cloud is right for you.

▸ Concentrate not on the technology, but the content.
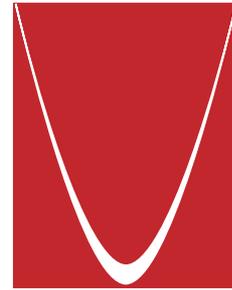
www.sandyaudiovisual.com
(301) 498-6363
csandy@savweb.com