This session provides tips and tricks, best practices, and lessons learned regarding the technical set-up of live streaming production. Learn how to stream multiple formats from a single encoder, use social networking overlays, leverage adaptive bitrate streaming, and transition between live streams from multiple camera angles using multi-encoder synchronization. Come learn how to deliver interactive, high-quality experiences for your next live event.
Who am I?

- Rob Roskin, Sr. Manager Video Operations and Emerging Technologies.
- ~15 years at MTVN/Viacom. ~10 years on live streaming.
- 20-50 Events per year, used to be 5-10.
- Live streaming lead for MTV, VH1, CMT, Logo, Comedy Central, TVLand, Nickelodeon, Spike, Game Trailers, Internal Events.
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Cameras
Cameras

- **Types**
  - **Static (non-moving):** Good for well lit areas where you won't need to pan or tilt. Ex: red carpet entrance.
  - **Robotic:** Good for areas that a body can’t take up due to regulations or a crew would be too expensive, but you still need mobility (pan/tilt/zoom). Ex: Green room or cameras on the stage itself.
  - **ENG Crew (Electronic News Gathering):** Good for when you have room for a few people and their gear, presents the best picture and can film anywhere.
Cameras (Continued)

- **Tips**
  - Make sure camera is not facing a light source.
  - When testing cameras outside, do it at the time of day the show will take place.
  - Don’t affix cameras where bass will cause vibrations to be visible.
  - Pan/Tilt/Zoom robotic cameras require lots of cabling, if working in a union house be cognizant of costs.
  - Be wary of using “prosumer” instead of professional equipment. Could spend more converting signals.
Encoder Setup

- Sync Timecode
  - What is timecode?
  - Why is synchronization important?
  - Mirandas
- Audio Synchronization
  - HE-1/2 VS. LC AAC
  - Keep each rendition the same audio bitrate.
- How to Choose Bitrates for Flash
  - Watch out for 512K users, 768K users.
  - No more than 2x the previous bitrate.
  - High end, 3K/3500 for 1280X720.
  - Use lower bitrates Internationally.
Encoder Setup Continued

- How to Choose Bitrates for Mobile
  - Don’t worry to much about resolution.
  - Keep a few in the 3G range.
  - Crank up the b/w on the Wi-Fi stream.
  - Hit Android and iOS in the same profile.
  - If Intl – don’t aim for Symbian, it’s not the best experience.

- Balance Streams Across Encoders
  - Don’t go in numerical order, the 3500 and the 2200 shouldn’t be on the same encoder.

- Key Frames
  - What they are.
  - How they affect the synchronization.
  - 3 seconds.
Encoder Setup Continued

- Naming Conventions
  - Crucial for multi-bitrate streaming.
  - Keeps everyone on the same page.
  - CDN of your choice might have specific naming needs.
  - Stream1.flv doesn’t help anyone.
  - MTV example: vma2011_greenroom_2200.
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Bandwidth and CDN’s

Internet
Bandwidth

- Watch ping times (latency) just as much as speed.
- Make sure you’re connecting to the closest ingest point of your CDN.
- Leave overhead for TCP/IP! 30% rule.
- Bandwidth is used more heavily when there’s motion, don’t test with a slate if you’re filming a concert.
CDN’s

• Live streaming is difficult to do on your own, use a CDN.
• Cloud encoding vs. CDN.
• Security
  • Swf Hash.
  • Token Auth.
  • RTMPE / HTTPS.
• Geographic dispersion.
Social Networking Overlays

- AttractTV / Clip Sync
Social Networking Overlays (continued)

- What to use as widgets:
  - Polls
  - Charts
  - Take a photo
  - Make requests
  - Suggestion box
  - Mini-Game
  - “Boss” view
  - Tweets
  - Statistics
- Integrate right into player rendition xml.
Social Networking Overlays (continued)

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</item>
Test!

- Do a dry run the day before.
- When planning, leave enough time to adjust bitrates day of the show.
- Shows go bad when:
  - Changes are made after everything is working.
  - Testing was not done with the equipment in the field.
  - Bandwidth was an afterthought.