Captioning and DVI
Broadcast to Web
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Before we begin...

• What are Closed Captioning & Descriptive Video Information?

  – Systems of Media Access for hearing-impaired and visually-impaired viewers

  – Each system has established conventions that should be respected
Closed Captioning

• Closed Captioning is mandated by the FCC for all broadcasts
  – Exemptions for non-emergency material under 10 minutes and small stations

• 21st Century Communications and Video Accessibility Act requires Closed Captions to migrate to IP distribution
Dear, everything is so confusing.
Descriptive Video Information

• The 21st Century Communications and Video Accessibility Act requires DVI to be passed through if present.
• Exceptions for technical inability or other use, such as existing SAP transmission.
The Challenge:

• Closed Captioning workflows are well-established and often automated

• Broadcast workflow may dictate IP-based caption workflow
Case Study: FRONTLINE

Workflow 2008
Case Study: FRONTLINE

• Workflow circa 2008
  – Adapted live captioning during Technical Evaluation and Dubs
    • Inefficient
    • Expensive
    • Prone to Errors
    • Did not meet TOS for Containerization
CC: Workflow Considerations

• Who is responsible?
  – Producer v. Distributor

• Where will the work be done?
  – Vendor v. DIY/ In-House

• What tools will you use?
  – Software v. Hardware
Producer v. Distributor

- Producer can control content changes and versioning
- Distributor streamlines delivery process & distribution
Vendor v. DIY

• Vendor is specialist in Captioning style, formats & file-types

• DIY allows for multiple changes to content, increasingly easy & cheaper
Software v. Hardware

• Software easily updated, installed on multiple workstations, generally cheaper

• Hardware is more efficient, automated & integrated into existing workflows
Closed Captioning

• Many file-types for Closed Captioning creation and distribution
  – .tds, .cap, .scc, .srt, .xml, .txt, .smi

• 21\textsuperscript{st} Century Communications and Video Accessibility Act designates SMPTE-TT as the safe-harbor format for IP distribution
Case Study: FRONTLINE

• Fast turnaround workflow with ability to make content changes up to last minute, preferably in-house
• Unable to hire in-house additional work
• Broadcast, Home Video and Web distribution
• Need Vendor for potential live broadcasts
Case Study: FRONTLINE

 Workflow 2013

 Caption Center
 CPC MacCaption/ CaptionMaker
 AVID Symphony
 HDCam OP1A File COVE
Case Study: FRONTLINE

- **Caption Center**
  - .tds for broadcast,
  - .scc for DVD, archiving

- **CPC MacCaption**
  - .aaf for Avid
  - SMPTE-TT .xml for Web
  - .smi for web
(translated): My greatest joy will be to become a martyr.

>> NARRATOR: Tonight on Perspectives,

two enemies face each other in a brutal civil war.

On one side, a young rebel soldier fighting to the death
to bring down the regime of President Bashar al-Assad.

(translated): My greatest joy will be to become a martyr.

and for Syria to be liberated.

>> NARRATOR: Facing him, a career soldier,
determined to preserve the Assad regime.

(translated): We are all martyrs in the making,
to keep our country safe.

>> NARRATOR: Two countrymen, now enemies.
in a conflict increasingly driven by hatred.

(explosion)
NARRATOR: Facing him, career soldier,
NARRATOR: Facing him, career soldier.

On one side, a young rebel soldier fighting to the death...
Ahmad returned to the front line, but was injured twice more.
Case Study: FRONTLINE

- **Avid Symphony**
  - HDCam output
  - OP1a file-based delivery
  - Avid DNX 145 Quicktime master
- **El Gato Turbo**
  - h.264 Quicktimes for COVE & mobile
  - Automated upload to FTP
Case Study: FRONTLINE

Workflow 2008

- House Channel
  - House Channel
- Stenocaptioner
  - Stenocaptioner
- Hdcam Playback
  - Hdcam Playback
- Evertz HD Encoder
  - Evertz HD Encoder
- HDcam Record
  - HDcam Record
- HDCam Record
  - HDCam Record
- HD Cam Record
  - HD Cam Record
- Digibeta Record
  - Digibeta Record
- Digibeta Record
  - Digibeta Record
- VHS
  - VHS
Case Study: FRONTLINE

Workflow 2013

Caption Vendor

CPC
MacCaption/CaptionMaker

AVID
Symphony

HDCam

OP1A File

COVE
Case Study: FRONTLINE

• Producer Centered
• Vendor & DIY
• Software Centered
• Broadcast & IP
Case Study: FRONTLINE

• Saved time fewer weekend encodes, no live steno-captioner

• Saved money – less overtime, less expensive process, less revision
Case Study: FRONTLINE

• Better quality – pop-up style captions, improved sync, content more easily corrected,

• Future-proofing – archiving .tds, .scc and .smi for alternate distribution
  – Complete File-based masters
Closed Captioning

• DIY captioning is not for everyone

• Take advantage of available resources
  – National Center for Accessible Media
  – Captioning and Description Key
Case Study: PBS COVE

• Steve Scheel
  – Sr. Director of Media Operations & Services, PBS Media Operations Center
COVE Captioning

- PBS.org - captions are added by the player when streams are played
  - Variety of captions formats accepted
    - TTML, SAMI, SRT, SCC, DXFP, and SMPTE TimedText
- Handheld device files (mp4, HLS) have captions inserted as scc data tracks during transcode in the cloud
Caption File Formats

- **TTML** - Timed Text Markup Language
  - DXFP
  - SMPTE Timed Text
  - “cleaned up” DXFP used by Cove streaming
- **SCC** - widely used
- **SAMI** - Does not contain positioning information
Containerized Program

Open | Und | Program Body | Und | Credits | Fill | Logo

Open | Program Body | Credits
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Automated COVE Caption Process

• XML list generated
• Cinegy transcodes pieces while extracting VANC or 436M captions into SMPTE Timed Text file
• Mezzanine video file is QC’ed by BATON
• Report, MP4 video file and TT file automatically uploaded to S3 cloud
Software Tools

• Cinegy Convert
• CPC

• Software tool for synchronizing caption (Nexidia, Softel)
Case Study: Live to IP

• Currently, no magic bullet
  – Some promising products

• Time delay in established workflows to ingest and prepare Captioning and video for web
Descriptive Video Information

• DVI is a separate audio track with additional explanatory voice-over to describe visuals and text

• DVI is not mandated by the FCC for PBS stations
DVI Broadcast Workflow

• 2-3 days for scripting, diction appropriate to your audience
• Separate voice-over artist, distinct from the narrator and other voices in your program
DVI Broadcast Workflow

• Combined with final mix (+2-3 hrs)
• Deliver as separate audio channel
• Broadcast as SAP,
  – Many TV's have an audio source selection to select Visually Impaired or other language audio source.
DVI IP-distribution Workflow

- Post secondary audio with media
  - COVE does not support SAP
  - JW Player does on desktop, not mobile
- Post as separate asset
- Post as Audiocast
Looking Forward

• Improved Broadcast to IP solutions
• Improved integration of Captioning in NLEs and Players
• Wider FCC mandate for DVI
• DVI for IP solutions
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