The Challenge: Advancing Cinema Quality

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Definition of Cinema

cin-e-ma n.

- A film or movie.
  A movie theater.
- Films or movies considered as a group.
  The film or movie industry.
- The art or technique of making films or movies; filmmaking.
Definition of Broadcast

broadcast  n.

- Transmission of a radio or television program or signal for public use.
  - A radio or television program: *watched the morning news broadcast.*
  - The duration of such a program.
Definition of Video

vid·e·o  adj.

- Of or relating to television, especially televised images.
- Of or relating to videotaped productions or videotape equipment and technology.
What Makes Film Standout?

- Motion Pictures are not video and not broadcast television
- Film projected on large screen, Broadcast uses a smaller screen having a fixed technology
- DC: Files vs Streams
- Cinematographer vs Cameraman
Film Quality

- Quality
  - Large dynamic range
  - Large color space
  - Long archival life

- Flexibility
  - Resolution & color can be improved without obsolescence
  - Aspect ratio (w/lens & aperture plate)
  - Sound
Digital Quality

- Quality
  - Dynamic range depends on bit depth
  - Color space can be very large
  - Archival life dependent upon storage

- Flexibility
  - Limits cannot be extended
    - requires forward thinking
Dynamic Range

- Film > 10 stops

- 12-bit Color Depth
  = ? stops (log)
  (DPX 10-bit > 11 stops)
Color Space
Resolution

Distribution

From Distribution
2K resolution
24-48 fps
12 bit color depth

Exhibition

Storage

2K Files

2K Projector

2K Extraction from 4K file

4K Files

2K-to-4K Up Res

4K Projector

From Distribution
4K resolution
24 fps
12 bit color depth
Flexibility in Packaging

COMPOSITION

COMPOSITION LIST
(feature - english)

POINTERs

REEL 1

IMAGE ESSENCE
(english, 2.35)

AUDIO ESSENCE
(english, 5.1)

SUBTITLE ESSENCE
(spanish)

REEL 2

IMAGE ESSENCE
(english, 2.35)

AUDIO ESSENCE
(english, 5.1)

SUBTITLE ESSENCE
(spanish)
Flexibility in Creating Shows

SHOW LIST

- Show List A
  - Start Composition #1
  - Start Composition #2
  - Start Composition #3
  - Start Composition #4
  - Start Composition #5
  - Start Composition #6
  - Start Composition #7

SHOW LIST B

EXHIBITION STORAGE

- Composition #1
- Composition #2
- Composition #3
- Composition #4
- Composition #5
- Composition #6
- Composition #7
Security & Trust

- Not a quality issue – but significant
- Trust with Film
  - Booth assumed to be locked
  - Camcorder copying a larger threat
- Trust with Digital
  - Encrypted content will be distributed
  - Trend assumes the booth is not locked
  - Camcorder copying a larger threat
What Holds DC Back?

- Cost
- Quality
- Flexibility
  - Interoperability weak if at all
  - Exhibitors have not experienced flexibility
- Security
- Business
Cost

- Projector
- Projector
- Projector
- Projector
- Projector
- Projector
- Projector
Cost

- Server
- Server
- Server
- Server
- Server
- Server
The Challenge

- Digital cinema can exceed the quality of film, but not with broadcast style technology.

- Cost, interoperability, security, and business issues remain to be solved.
Thank you

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