

Class Agenda

DAY 1

1. Introductions and expectations for the course *30 minutes*
 - a. Introduce AV Signal Transport Masterclass scope and the topics we will explore
 - b. Review of the presentation platform, features and capability
 - i. Breakout rooms
 - ii. Hallway conversations
 - c. Presenter introductions
 - d. Support staff introductions
2. Review course agenda *05 minutes*
3. Poll 1 *05 minutes*
 - a. Essentially an introductory poll to engage the audience and engender familiarity with the presentation platform
4. Emerging Technologies to Watch For *10 minutes*
 - a. Featured Emerging Tech #1
 - b. Featured Emerging Tech #2
 - i. MOCA
5. OTT versus OTA *30 minutes*
 - a. OTT
 - i. a media service offered directly to viewers via the Internet. OTT bypasses cable, broadcast, and satellite television platforms, the types of companies that traditionally act as controllers or distributors of such content.
 1. Streaming
 - a. Bit Rates Methodology

2. VOD

b. OTA

- i. high-definition television broadcast from local television stations in your area.
- ii. various methods of distributing new software, configuration settings, and even updating encryption keys to devices like mobile phones, set-top boxes, electric cars or secure voice communication equipment.

1. Satellite Broadcast

- a. US and EMEA compare and contrast major technological concepts. Define and illustrate bandwidth constraints

2. Terrestrial broadcast

- a. US and EMEA compare and contrast major technological concepts. Define and illustrate bandwidth constraints

b. CATV

- c. ATSC 3.0 review

6. Poll 2

05 minutes

- a. Question pertaining to material we've covered

7. AVoIP Concepts

50 minutes

a. Defining resolution

- i. Spatial resolution
- ii. Temporal resolution
- iii. Radiometric resolution

b. What is compression?

- i. Interframe

- ii. Intraframe
 - iii. Object-based encoding
 - c. Special content attributes
 - i. Chroma subsampling (chroma decimation)
 - 1. 4:4:4, 4:2:0
 - ii. HDR & HDR10+
 - iii. DolbyVision, ATMOS & DTX
8. Streaming and Long Distance Codecs *50 minutes*
- a. Common Audio and Video Codecs
 - i. H265, H264
 - 1. Profiles - Baseline, Main, and High
 - ii. VP9, AV1
 - iii. AAC, MP3 for audio
 - b. What are wrappers, why are they important?
 - c. Transport Protocols, bandwidth & recommended encoding settings
9. Group break-out exercise *30 minutes*
- a. Where is your audience and what do you need to communicate to them? (15 minute discussion)
 - b. Present results of break-out exercise (15 minutes)
10. Summary Day 1 *15 minutes*
11. Preview Day 2 *05 minutes*

DAY 2

- 1. Review course agenda and previous day *10 minutes*
- 2. Poll Question 3 *05 minutes*

3. Emerging Technologies to Watch For *10 minutes*
 - a. Featured Emerging Tech #3
 - b. Featured Emerging Tech #4
4. 25G & 10G LAN Video transport Codecs *50 minutes*
 - a. VC-6, SMPTE 2117 & SMPTE 2110
 - i. Separation of Audio, Video and Timing
 - b. SMPTE 2022
 - c. SDVoE
5. 1 Gig LAN Video transport codecs *50 minutes*
 - a. NDI
 - b. JPEG2000/JPEG-XS
 - c. VC2, Dirac
 - d. H264
 - e. Physical Layer Considerations for AV design
 - i. Layers 1, 2 and 3 only
6. SMPTE SDI, HDSDI, 3GSDI, 12G SDI *15 minutes*
7. HDBaseT *50 minutes*
 - a. 3.0 Standard and HDBaseT T-Packets
 - b. Physical layer considerations
 - i. 1G tunneling
8. Group break-out exercise *30 minutes*
 - a. Where is your audience, what do you need to communicate to them? (15 minute discussion)
 - b. Present results of break-out exercise (15 minutes)
9. Summary Day 1 *15 minutes*
10. Preview Day 3 *05 minutes*

DAY 3

1. Review course agenda and previous day *10 minutes*
2. Poll Question 4 *05 minutes*
3. Emerging Technologies to Watch For *10 minutes*
 - a. Featured Emerging Tech #5
 - b. Featured Emerging Tech #6
4. HDCP *25 minutes*
 - a. Legalities of HDCP
 - b. HDCP 2.1 and HDCP Pro in system design
5. HDMI 2.1 *50 minutes*
 - a. Passive connectivity
 - b. Active cable connectivity theory and application
 - c. Physical layer considerations
 - i. I2C
 - ii. Handshake/EDID/HPD Power
6. USB4/Thunderbolt *50 minutes*
 - a. USB Type-C
 - i. EMCA
 - ii. Billboard technology
 - iii. DP-over-Alt-mode
 - iv. DisplayLink
 - b. DisplayPort
 - c. Thunderbolt
7. Color Space *25 minutes*
 - a. Rec709, sRGB
 - b. Rec2020

8. Desktop AV	<i>25 minutes</i>
9. Poll Question 5	<i>05 minutes</i>
10. Summary and closing thoughts	<i>20 minutes</i>

Learning Objectives

At the end of this series of classes participants will be able to:

1. Understand and explain the basic characteristics of an advanced AV signal and relate that to necessary transport methods and considerations
2. Describe the differences between long-distance OTT, on-premise production and general AV signal distribution over an IT network
3. Apply non-network technologies to AV signal transport within a building, facility or room
4. Anticipate, understand and apply high dynamic range (HDR, HDR10+), extended gamut color (xvYCC) and other emerging attributes of advanced AV payloads as they pertain to system signal transport design.