Benefits of IP Systems for Sporting Venues

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Professional Sporting Venues

• OB Trucks are hired to do the television production for the rightsholders
• The “inside production” facility is part of the venue
  – Drives content for the scoreboards and inside displays
  – Includes replay, specialty cameras, switcher, graphics, multiviewers, etc.
  – Provides inside feeds to the Rightsholder’s trucks
  – Consumes lateral feeds from the Rightsholder’s trucks
• NFL Football: 8 home games + playoffs (per year)
• NBA Basketball / NHL Hockey: 41 home games + playoffs
• The arena is used for many many other events throughout the year
  – A typical large venue will have 250+ events per year
  – Every event has different internal production requirements
University Sporting Venues

• Sometimes OB Trucks are hired for big games (only)

• The “inside production” facility is used for every game across many sports
  – Produces the game feeds if there is no truck
  – Drives content for the scoreboards and inside displays
  – Includes replay, specialty cameras, switcher, graphics, multiviewers, etc.
  – Provides/Consumes signals to/from Rightsholder’s trucks when present
  – Often produces an entire specialty channel of on-campus content

• One Sport (usually “Football”) drives the inside production system
  – But the system is used by every sport on campus
  – Fiber Connections to other venues on campus for other sports
  – College Campuses can be very large

What Makes it Interesting?

• These Stadiums are VERY LARGE – fiber runs can be >500m
• Sometimes it’s a re-fit into an existing structure
• Flexibility is paramount – every event has different production needs
• Audio
  Audio
  Audio
• Integration with the Truck Dock – formats/handoffs
• Integration across the campus
• Freelance Operations Staff – or Student Operators
Benefits of IP/2110: Physical-Scale

- 25G/100G fiber infrastructure
  - 8x 3G signals per fiber wavelength
  - Can mix AOC-direct-attach, OM4, and SingleMode for optimized economics

- Redundancy of the Infrastructure
  - 2022-7 protects against loss and errors in every fiber
  - 2022-7 protects against loss and errors in every SFP
  - 2022-7 protects against loss and errors in every network switch

- Takes Up Less Space and uses a lot fewer cables

- Going IP means never having to say that you can’t make it bigger
  - UHD-capability can be built into the infrastructure
  - Network Switches can be as big as you want

Fiber to the Cores

- “Small” 4-slot network switches support up to 144 x 100G ports
  - Approx 4600x4600@3G
  - Approx 1152x1152@UHD

- Active (AOC) Direct-attach for in-room
- Multimode (OM4) for <400m
- Singlemode for longer runs
End-To-End IP

• IP Fiber from the CCU
• IP Fiber to the Multiviewers

LESS CABLES OVERALL

Benefits of IP/2110: Audio

• SDI is limited to 16ch of audio per video
  – requires embedding and dis-embedding at every touch-point

• In ST2110, the audio is sent on separate IP streams
  – Audio console can subscribe to every stream it needs
  – Audio console generates new streams for its outputs

• Separate Audio == Total Flexibility == 250+ different events/year

• The Control System ties it all together
  – Every user gets the audio and video (and ANC data) they need for their job
  – Every production can be easily configured
Benefits of IP/2110: Timing

• PTP Timing on the Media Network
  ‒ Uses the same cables and switches as the Media
  ‒ No Black-Burst DA tree to Design, Build & Maintain
  ‒ No Timecode DA tree to Design, Build, & Maintain
  ‒ No Crazy Mix of Black-Burst, Tri-Level, Word Clock, DARS, ...

• PTP is Format-flexible across SD, HD, 3G, UHD

• PTP == timestamps on every packet of video and audio
  ‒ the tools are there in the standards to help with sync
  ‒ allows equipment to synchronize audio and video anyplace in the system

Benefits of IP/2110: Choices

• Every Meaningful Vendor is building ST2110 interfaces now

• Customers want to choose their Cameras, Switchers, Replay, Multiviewers, and other equipment based on operational criteria – not technical limitations

• 2110 provides the level playing field for best-of-breed systems
Basketball Arena #1

Football Arena
Basketball Arena #2

IP/2110 for Sports: Perfect Together

- Scalability to build systems of whatever size is needed
  - for HD, 3G, or UHD
- Economy of Physical Space and Cabling
- Audio Flexibility for more channels, more streams, more ways
- Timing Flexibility managed through PTP Timestamps
- System Flexibility provides choices of vendors and partners

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Thank You