2110 Based OB Solution
Mobile Application

The Challenge

- Design a COTS based infrastructure solution for
- Customers core requirements:
  - COTS based infrastructure - Arista
  - Standards based –ST-2110
  - Mixed Reference Environment – Black Burst and PTP
  - Signal agnostic – HD 1080i 60 and UHD
  - Future-ready - HDR (High Dynamic Range) and 1080p
  - Simplified wiring— multi-mode and single-mode fiber
The Challenge

- Technical requirements:
  - 8+ Simultaneous Productions
  - As Much IP at the Edge as Possible
  - IP Switchers
  - Very large IP multi-viewer requirement 960x80
  - Extensive IP Connectivity with Video & Audio Processing
  - Remote Production Requirement
  - Flexible FPGA processing

Key that the users don’t know or care about the technology
How did we do it?

• COTS IP Core
  o Arista 7508R
    o Customer required COTS core
    o Large Single Chassis allows for simple non-blocking architecture

How did we do it?

• Gateways
  o Small failure block was key to high availability solution design
  o Flexible FPGA core
  o MV
How did we do it?

- IP Multi-viewers
- IP Switchers / Vision Mixers
- SDN Control and Flow Management
- Unified facility monitoring and configuration
- As much IP at the edge as possible

Solution Topology
Solution Comprised of three designs
- Broadcast Center
- Remote Fly Packs
- Mid-Sized Production Truck

Broadcast Center Overview
Remote Site Overview
FLY PACKS 1 of 4

Arista 7508R
IP Switches fitted with 4x line cards: 4x 36 100Gports

GV IP Gateways
SDI I/O IQMIX25 x32
(256x256 3G)
3 Frames

3 Frames

Upstream Client Control Network

100GbE links

3 Frames

Arista 7508R
IP Switches fitted with 4x line cards: 4x 36 100Gports

PTP / Sync Generator

Configuration

FLY PACKS 2 of 4

Arista 7508R
IP Switches fitted with 4x line cards: 4x 36 100Gports

GV IP Gateways
SDI I/O IQMIX25 x32
(256x256 3G)
3 Frames

5x Multiviewer Resize Engines
Up to 60x Outputs

5x MV-820 IP Multiviewers

MADI IQAMD4010 Cards can be distributed as required between Fly Packs

100GbE links

MADI IQAMD4010 Cards can be distributed as required between Fly Packs

FLY PACKS 3 of 4

Arista 7504R
(Additional Frame Existing Line Cards)
IP Switches fitted with 4x line cards: 2x 36 100Gports 2x 36 40Gports

GV IP Gateways
SDI I/O IQMIX25 x32
(256x256 3G)
3 Frames

240x Multiviewer Resize Engines
Up to 60x Outputs

5x MV-820 IP Multiviewers

MADI IQAMD4010 Cards can be distributed as required between Fly Packs

100GbE links

AUDI O XS (Software Router)

FLY PACKS 4 of 4

2x 1U IP Switches fitted: 32x 100G ports 4x 10Gports

2x Arista 1RU Switches DCS-7260

2x Panels as required

5x MV-820 IP Multiviewers

240x Multiviewer Resize Engines
Up to 60x Outputs

5x MV-820 IP Multiviewers

MADI IQAMD4010 Cards can be distributed as required between Fly Packs

100GbE links

AUDI O XS (Software Router)
Mid-side Remote Truck

24 Camera OB Truck Example

1x 71 Key 2U LCD
10x 39 Key 1U LCD

IP Monitoring

Control Panels

Upstream Client Control Network

IP Edge Control Servers

PPS / Sync Generator

GV IP Gateways

- 23x SDI I/O IQMIX2S
- IQ 4U Frames x3
- OPTION: 7x IQVDA02 - Analog Video and World Clock Distribution

MADI/IP Conversion

- 2x IQAMD4010 (redundant)
- 1x IQ 3U Frame

Audio routing & processing

- Audio Live (redundant)

GV IP Switches fitted with 2x line cards:

2x 36 100Gports

10GbE links

Main Areas

x16 Heads x 12 Tiles per head

Secondary Areas

x12 Quad Splits

OPTION: Emergency Cut SDI Router Vega 30 - 34x34

OPTION: 2x UHD1100 (4K DC)

M4/E 32 source Maverik Panel

Audio routing & processing

- Audio Live (redundant)

IP Kahuna 6M/E (Format Fusion)

4M/E 32 source Maverik Panel

1x Arista 7504R

IP Switch fitted with 2x line cards:

2x 36 100Gports

Configured with Redundant line Cards

GV IP Gateways

- 23x SDI I/O IQMIX2S
- IQ 4U Frames x3
- OPTION: 7x IQVDA02 - Analog Video and World Clock Distribution

PSS / Sync Generator

SPG8000A — use Meinberg Slave unit to circumvent high client count issues (NOT currently included in proposal)

10GbE links

192x Multiviewer Resize Engines

OPTION: 5x MV-820 IP Multiviewers

152x Multiviewer Resize Engines

10GbE links

10GbE links

100GbE links

2S5GbE Links

GV IP Gateways

- 23x SDI I/O IQMIX2S
- IQ 4U Frames x3
- OPTION: 7x IQVDA02 - Analog Video and World Clock Distribution

PSS / Sync Generator

SPG8000A — use Meinberg Slave unit to circumvent high client count issues (NOT currently included in proposal)
Challenges

• Audio Routing
  o How do you feed proper audio to IP endpoints
  o Audio Channel Swaps
    o Multiple 2110-30 Levels in play
  o Flexible FPGA platform
    o Licensing?

Decisions

• Audio Routing
  o How do you feed proper audio to IP endpoints
  o Audio Channel Swaps
    o Multiple 2110-30 Levels in play
  o Flexible FPGA platform
    o Licensing?
Thank you!  Questions?