Requirements to reality

A brief history of Current
About me:

Stéphane Savard

- Consultant at Current from Dec. 04
- Chief Scientist for Current 2006-2009
- 30 years in Media
- Director Software Dev. at Miranda 1999-2002 (iControl, Kaleido, Densité...)
- more see savardfaire.tv
Key requirements

- Receive content from viewers, up to 30-50% of total on air
- Accept contributions in virtually any formats
- Lots of dynamic text
- Office space as production spaces
- HD Ready
- Remote production - Link with LA stage
- Flexible control rooms
- Multiple editing stations in open spaces
- Open look on the street
- Short delay to air
- Integrate with web site
Viewer Contributions: Requirements

- Quick and easy contribution
- Limit manipulation and transcoding
- Two way interaction with external content
**Viewer Contributions: Solutions**

- Using DV as the primary format - production, ingest, editing, playout
- Using Final Cut Pro as editing platform
- Quicktime DV-25 end-to-end
- Central storage for collaboration and time to air
- No Windows on signal path
Multiple sites, remote production

* Production and editing are split among multiple locations
* Needs seamless collaboration for studio production, editing, viewing, legal...
Remote production
LA-SF

* Can send 3 simultaneous video signal and 16 audio channels
* Full Intercom integration
* Return signal
Network 2005
Network 2005
WAN Challenges

* Share a single link for Internet traffic, interactive MPEG-2 video production, VoIP, Intercom and file transfer
* Link is often oversubscribe
* Must use QoS
MPEG-2 for production

- Use lowest possible delay
- P-frame only GOP
- 4:2:2 color space for remote chroma key
- LA-SF around 240ms end-to-end at 25 Mbps
- Not tolerant of packet loss or jitter
Network 2005

- Internet
- OC3 @ 155 Mbps
- IP Port @ 100 Mbps
Main elements of playout

Isilon Node

main (pb03)

back-up (pb04)

SDI
RS-485
Ethernet
Pseudo-Sync DV over Gig-E

PGM
PVW

AIR
Main elements of playout

Isilon Node

main (pb03)
dv playout servers (BUG:tv CLASS-1)

back-up (pb04)

Pseudo-Sync DV over Gig-E

SDI
RS-485
Ethernet
Pseudo-Sync DV over Gig-E

PGM
PVW

AIR
Main elements of playout

- Isilon Node
  - main (pb03)
  - back-up (pb04)

- dv playout servers (BUG.tv CLASS-1)

- Cisco 4507 in CER

- SDI
- RS-485
- Ethernet
- Pseudo-Sync DV over Gig-E

- PGM
- PVW

- AIR
Main elements of playout

Parts of the MCR

Cisco 4507 in CER

SDI
RS-485
Ethernet
Pseudo-Sync DV over Gig-E

PGM
PVW
AIR
Main elements of playout

Communicate with each other thru the switch

Cisco 4507 in CER

SDI
RS-485
Ethernet
Pseudo-Sync DV over Gig-E

PGM
PVW

AIR
Isilon Architecture
Isilon Architecture

Infiniband Sw

- Isilon Node
- Isilon Node
- Isilon Node
- Isilon Node
Isilon Architecture

Infiniband Sw

Isilon Node

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Isilon Architecture

Infiniband Sw

Isilon Node
Isilon Node
Isilon Node
Isilon Node
exp. Node
Isilon Architecture

- Isi. Acc. Node
- Isilon Node
- Isilon Node
- Isilon Node
- exp. Node

Networks:
- Ethernet
- Infiniband
- Pseudo-Sync 270Mbps over Gig-E
- Pseudo-Sync DV over Gig-E
Isilon Architecture

- Isi. Acc. Node
- Isilon Node
- Isilon Node
- Isilon Node
- exp. Node

Connections:
- Infiniband Sw ➔ Isi. Acc. Node
- Infiniband Sw ➔ Isilon Node
- Infiniband Sw ➔ Isilon Node
- Infiniband Sw ➔ Isilon Node
- Gig-E switches

Networks:
- Ethernet
- Infiniband
- Pseudo-Sync 270Mbps over Gig-E
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Isilon Architecture

- Isilon Node
- Isilon Node
- Isilon Node
- exp. Node
- Infiniband Sw
- Infiniband Sw
- Gig-E switches
- FCP
- render01
- render02
- Pseudo-Sync 270Mbps over Gig-E
- Pseudo-Sync DV over Gig-E
- motion graphics (mg03)
Isilon Architecture

- playback (pb03)
- motion graphics (mg03)
- Isi. Acc. Node
- Isilon Node
- Isilon Node
- Isilon Node
- exp. Node
- render01
- render02

- Infiniband Sw
- Infiniband Sw
- Gig-E switches
- FCP

Connections:
- Ethernet
- Infiniband
- Pseudo-Sync 270Mbps over Gig-E
- Pseudo-Sync DV over Gig-E
A few notes

- Working with a System Integrator; easier and faster for ordering and accounting
- Network install is long... order early
- Contract process is long
Distributed Playout architecture

* All playout equipment is at uplink site for UK and Italy

* All monitoring and control is done from San Francisco MCR

* Playout can continue even if the WAN is interrupted
Challenges

* Expertise - IT folks don’t understand TV specific needs - TV people don’t understand IT

* Timeframe: Creative always want to change things, long lead time on technical infrastructure
Challenges

- Central storage with in-place editing and viewing for 100+ stations
- Non Windows signal path
- Mixed data network
- Locations/remote control
- Path to HD
MPEG-2 GOP

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Mixed HD/SD Playout

SD Source

HD Source

Imagestore HD

Imagestore SD

Air HD

Air SD

Program

Preview

HD Program

HD Preview

X Converter

SD Program

SD Preview

Program

Preview

HD Program

HD Preview
Mixed HD/SD Playout

SD Source

HD Source

Imagestore HD

Imagestore SD

Air HD

Air SD

Program

Preview

HD Program

HD Preview

SD Program

SD Preview

X Converter