Going Digital at CNN

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Agenda

- What is CNN solving?
- Pro's, con's and challenges
- CNN's approach to a solution
- Project plan and deployment
- Current status
- Summary & Conclusions

What Are We Solving?

- Moving existing acquisition, production and playout operations from physical media (videotape) to file-based operations
- Edit and transfer media at a faster rate than with video tape (normal play speed)
- Reduced time-to-air for produced news packages
- Improved access to archived media

Why Are We Solving the “What?”

- Simplicity
- Manageability
- Adaptability
- Competitive edge

How Are We Solving the “What?”

- IPE – Integrated Production Environment
  - Media Asset Management
  - Ingest/recording – Scheduling
  - Production
  - Playout
  - Archiving

Moving From Atoms to Bits…

- From Videotape
- To Files
- 24 x 7 x forever
- One hour of DV25 Video w/4-Channels of uncompressed audio and 6 lines of uncompressed VBI =
  - Approximately 14.4GB of disk space for hi-res media ~350GB per day
  - Approximately 1GB of disk space for lo-res (proxy) media ~22GB per day
- Editing
  - Hi-Resolution
  - Low-Resolution
- File transfer
  - Acquisition
  - Archiving
  - Transfer to other locations

Pro's

- Media is available prior to completion of recording for
  - Editing
  - Playout (delay)
- Difficult to misplace media
- Media is shared
- Media is versioned
- Faster and more flexible acquisition, production and distribution of news and information
- Media transfer faster than real time

More Pro's

- Technology advancements
  - Increasing speed improves workflow and productivity
  - Faster file transfers
  - Cost vs. performance

Con's

- Not a lot of industry data or information
- Similar "at scale" reference architectures difficult to locate
- Deployment timescale vs. technology improvements
  - Faster CPU's
  - Bus architectures and form-factors

Challenges

- Moving existing workflow from physical videotape to file-based operations
- Maintain quality, minimize generational/format-to-format conversion (transcoding) losses
- Utilizing IT & IP Technology in realtime video production & workflow
- Leveraging technology to enhance workflow
- Small number of worldwide users at this scale
- Ubiquitous access to all material without copying
- Sustaining 24 x 7 x forever operations
- Media asset management
- Archiving
- Security
- Modifying standard IT and IP technologies
- Integration with existing systems

More Challenges

- Maintaining backward compatibility
  - OS
  - Applications
  - Configurations
  - Hardware
  - System architectures
  - Bus architectures
- Maintaining forward compatibility
  - Optical disc acquisition vs. tape
  - Media file formats
  - High definition (HDTV)
- Minimizing throw-away technology and associated costs

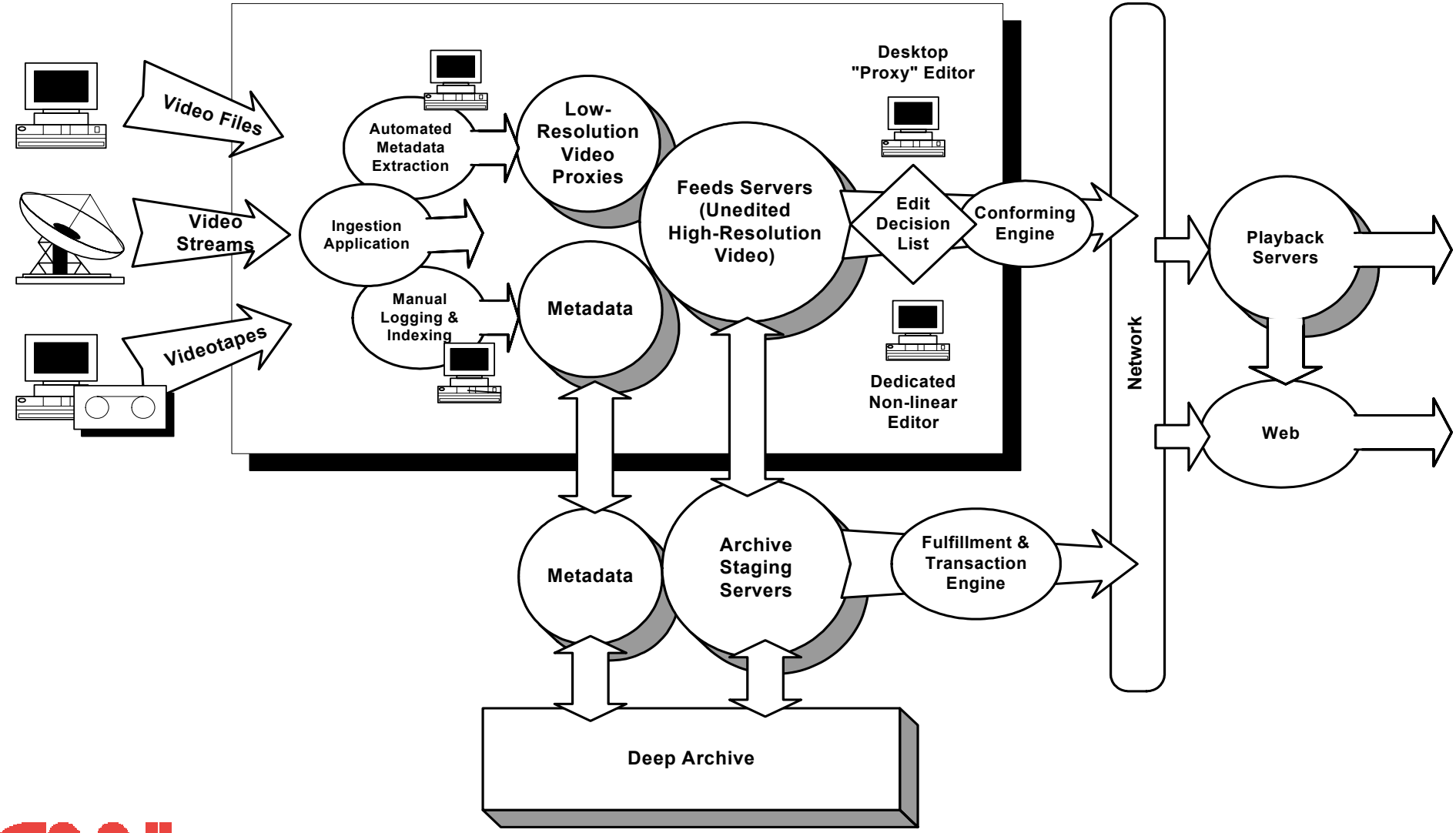
Even More Challenges!

- Broadcast equipment manufacturer made the media and devices to record and play media
  - Mindset change from physical media to file format compatibility (exchange)

Project Phases

- Inception
- Requirements
- Elaboration
- Research
- Contractual
- Construction
- Transition

Workflow


Video Files
Video Streams
Videotapes
Automated Metadata Extraction
Ingestion Application
Manual Logging & Indexing
Low-Resolution Video Proxies
Metadata
Feeds Servers (Unedited High-Resolution Video)
Desktop "Proxy" Editor
Edit Decision List
Conforming Engine
Dedicated Non-linear Editor
Network
Playback Servers
Web
Metadata
Archive Staging Servers
Fulfillment & Transaction Engine
Deep Archive

Tools

- Multi-channel automated and scheduled ingest
- Editing platforms
  - Hi-Resolution "Craft" editors
  - Lo-Resolution "Proxy" desktop editors
- Proxy browse
- Playout to air
- Media management
- Catalog of approximately 150,000 hours (~1.5 exclusive items)
- Digital archive – Long term storage of the individual items in the catalog

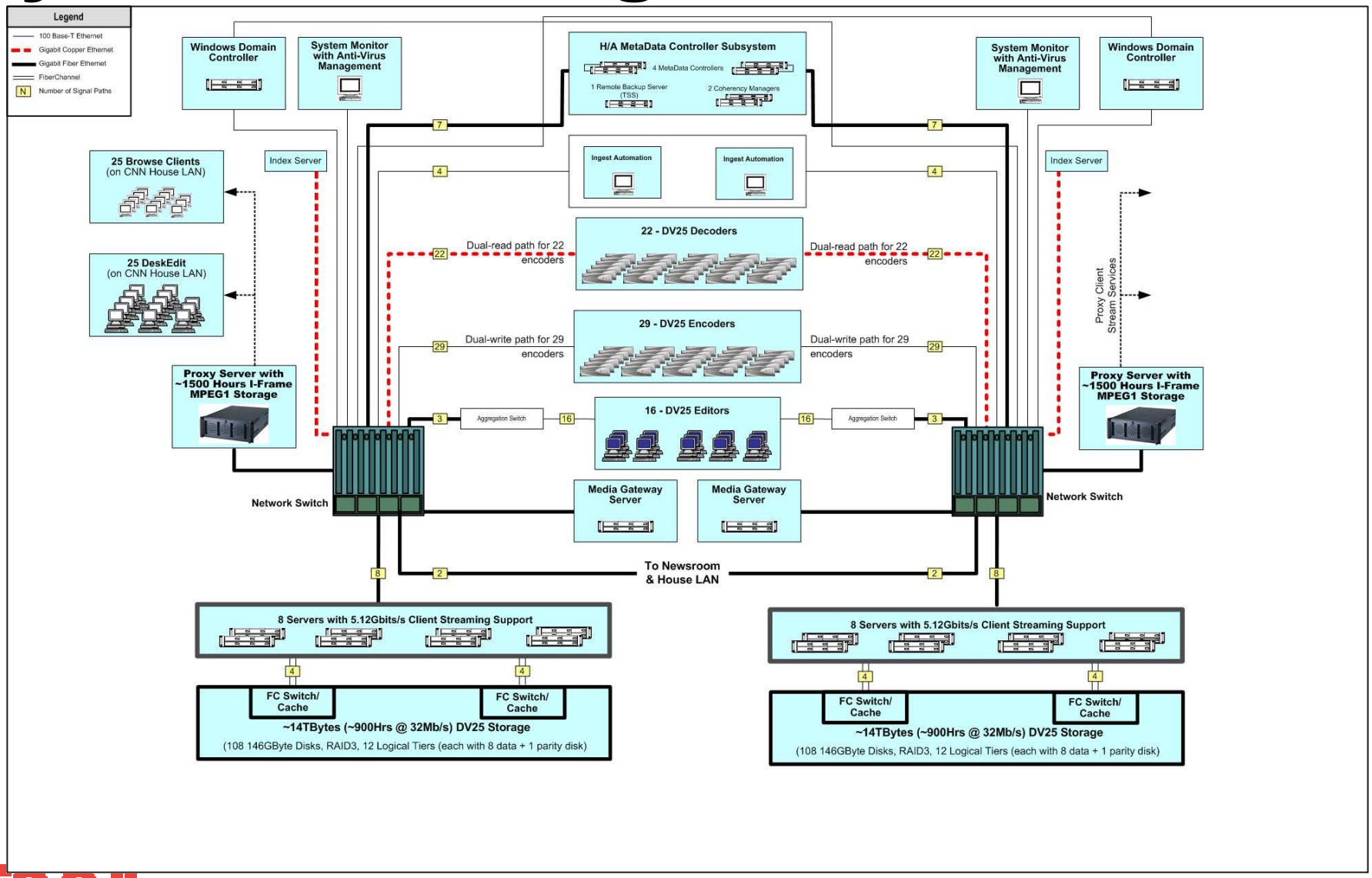
System Deployment

- CNN New York
  - 2 x ~14TB High Resolution “Cores”
  - 2 x 2TB Low Resolution “Cores”
  - Approximately 900 hours of broadcast quality video, expansion to 1,800 hours (~28TB) planned for 2005
- CNN Atlanta
  - 2 x 28 TB High Resolution “Cores”
  - 2 x 2TB Low Resolution “Cores”
  - Approximately 1,800 hours of broadcast quality video

System Architecture

- NAS + SAN
- High-performance disk subsystem
- Realtime performance
- Designed for peak demand
- NSPOF – No Single Point of Failure
- Two server sub-systems capable of supporting all clients
- No system downtime for upgrades

System Drawing



Archiving

- Atlanta video archive currently consists of a huge collection of videotapes, some of which have deteriorated so badly that they can only be played one more time
- The digital successor for this archive will consist of a large hierarchical storage installation
- Capable of ingesting 200 hours of video per day
- Transferring an estimated 280 gigabytes of data every hour
- Storage requirements for this archive are in excess of a petabyte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CD
EF
JK

Summary & Conclusions

- Videotape to server-based operations are currently in transition at both CNN-Atlanta and CNN-NY
- Workflow enhancements via middleware integration to other systems continue to be made
- Standard IT and IP-based technologies can be modified and used for server-based ingest/edit/playback of broadcast quality media
- Workflow innovation and time-to-air improvements
- System and playback reliability