37th Annual
PBS Technology Conference

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Chief Technology Officer
PBS
Welcome!

• I’m thrilled to officially open this year’s event …

• … but even more so, I’m looking forward to meeting you at my first TechCon!

April 3, 2014
TechCon 2014

• 464 total registrations (up 20%!)

• 233 staff from:
  – 106 stations
  – 90+ speakers
  – 68 sessions
  – 39 sponsors & exhibitors

• All in 2.5 days!
One year ago …

John shared challenges and opportunities faced by stations and by PBS:

• Public Media was at an inflection point
• Technology and infrastructure capital needs
• New Interconnection by Sept 2016
• Spectrum repack implications
• Disruptive technologies: Internet and IT model, cloud architectures, new standards
• Changing consumer landscape
My first 60 days
(has it been that long?)

• Warm and sincere welcome, I can already claim the start of new friendships.
• Impressive talent and dedication to a deeply meaningful mission
• Fast moving and dynamic:
  – January Board meeting
  – T&O projects; deals and organization; RFI vendor responses
  – APTS Public Media Summit
  – Coordination with NPR and CPB
  – ETAC meetings
  – Interconnection Sub-Committee meetings
  – Station visits: WGBH, Richmond, Jacksonville. Many more to come!
  – 2015 Budget preparation
  – March Board meeting
  – … TechCon
My first impressions

• Public Media is a strong and vibrant sector
• Stations are unique and diverse
• Changing markets, technologies and business models challenge stations in varying degrees
• Opportunities for coordination and cooperation
• My commitment to lead by example by focusing on the needs of the stations in order to make the Public Media system successful
What we’ll talk about today

• Where are we today?
• Changing marketplace
• Technology never stops
• Technology vision and strategic plan
Where are we today?
T&O: Strategy and Planning

• Established PMO to structure and track technology projects and investments
• Developed Technology Strategic Plan
• Spectrum, spectrum, spectrum
• Public Broadcasters International 2013
• Pilots of key technologies
A Few Words On Spectrum

• FCC’s intended timeline
  – Rulemaking this summer
  – Auction 2015
• PBS, APTS, CPB continue to work together in support of the system
• 3 conference sessions on related topics
T&O: Engineering and Operations

PBS completed Satellite Operations Center renovations:

- Redundant power distribution
- UPS
- Backup power generators
- Cooling
T&O: Engineering and Operations

Before
T&O: Engineering and Operations

After
June 2013 – PBS programming launched on HD05
August 2013 - Debuted “carrier ID” on Ku interconnection transponders. First time!
March 2014 - Diversity at NET moved to new DDMS build out
January 2014 - Program “file delivery” now reliable and routine. Over 850 files were processed for Downton Abbey Season 4.
Implemented automated processes to provide captions for COVE
T&O: IT / Development

• myPBS – new Extranet will modernize critical communications tools
  – Real time schedules
  – Collaboration platforms
  – Streaming previews to the desktop.

• Digital Asset Management DAM will become a major piece of PBS technology roadmap for managing assets and metadata

• Enterprise Service Bus ESB Pilot –
  – Simplify back office broadcast architecture
  – Provide a more robust and scalable environment.
T&O: NGIS Progress

• NRT Monthly Content Usage
  – 40% growth in FY14: 7400 files used/month

• NRT Station Utilization
  – 50% growth FY14: 94 Stations Currently

• DDMS (Disaster, Diversity, Maintenance)
  – Staff currently training
  – In Full DR use by FY15
T&O: WARN Program

• Go-live with Wireless Emergency Alerts on May 6, 2014

• Power Back-up Sub-grants
  – Awarded 82 sub-grants
  – $20.8 million awarded for infrastructure hardening

• Preparing for the future with CAP Message Integration by May 31, 2015
v6 Interconnection

• **RFI Completed – October 2013 - March 2014**
  - Response - 66 Vendors across 3 sections
  - Review - 18 reviewers, 12 PBS, 6 Station representatives
  - Follow-up - 12 vendors invited in for presentations
  - Summary reports & recommendations

• **Proof of Concept – July 2013 - still underway**
  - Test technology & prove assumptions
  - Push the Technology to find the limits
  - WHRO, VPT & WQED Live to air
  - Findings, reports and recommendations being compiled
Changing marketplace
Who’s watching TV?

• Viewing habits changing VERY rapidly
• Large-screen, family-room experience going to multiscreen, mobile experience
• Program listing guides going to personal search navigation
• PVR and web are diminishing value of advertising/promotion insertions
• Short and interactive video content growing, especially for new generations
Who’s creating TV?

• High quality video programs continue to be audience winners
• More and more informal video content is consumed
• User-generated, repurposed and spontaneous video programs are finding many eyeballs
• Growing fraction of video content (in fact, all content) is becoming an app, a mashup of content from several sources with interactivity and functionality
Who’s distributing TV?

- Broadband has reached its tipping point
- Fiber to the home is now cheaper than any other delivery of broadband. New builds and replacement builds will be FTTH
- Cable industry is consolidating big time! Remember Ma'Bell? Well, soon it will be Ma'Comcast 😊
- Cable, Google Fiber, FiOS, … all on track to deliver symmetric Gb/s IP pipes to consumers
- Satellite and broadcast one-way services will remain important for years to come, but will struggle to capture new waves of media opportunities
Public Media impact

• Changes in consumer behavior are particularly acute in younger audiences
• Public Media’s role in education and public service means our brands and programs must stay relevant to new generations
• It is important to our mission to be focused on the future and on the trends defining evolving market trends
Technology never stops
Wave of “video IP technology”

- The Internet has been a big thing, but you ain’t seen nothing yet!
- Computing power, memory and bandwidth, and the software tying it all, are conspiring to highjack video into the wild world of the Internet
- Be prepared for the changes: new systems, new vendors, new workflows, new governance, new business models
- It will be challenging but rewarding. And we will standing tall among the winners in this new world
The Age of ZETTABYTE (that’s $10^{21}$)

“The future of Internet traffic is video”

• Cisco forecasts an annual global Internet traffic of 1.4 zettabytes by 2017, compared with “just” 528 exabytes in 2012

• 80-90% of Internet traffic in 2017 will be video

IEEE Spectrum, March 2014
The Age of ZETTABYTE (that’s $10^{21}$)

Video will dominate consumer Internet traffic in 2017. In fact, these figures underplay the amount of video, since much of file-sharing traffic (once the scourge of overwhelmed ISPs) consists of movies and TV shows.
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IEEE Spectrum, March 2014
When video goes IP...

Technology implications on several fronts:

- Systems are interoperable: proprietary becomes a four letter word
- Universal connectivity and addressability
- Hardware gives way to software-defined solutions
- Content becomes assets: tagged, searchable, sharable
- Leverage systems from other industry domains
When Public Media goes IP...

Technology implications for stations:

• Systems are interoperable => lower costs and more flexibility with vendors

• Universal connectivity and addressability => collaboration and sharing among stations, easier reach to consumers

• Hardware gives way to software-defined solutions => leverage cloud models, OpEx vs. CapEx

• Content becomes assets: tagged, searchable, sharable => API models, new services

• Leverage systems from other industry domains => faster development, more innovation, best practices
What should Public Media do?

• Understand and embrace
  – the changing marketplace
  – the technology trends
  – the changing business models

• Adapt and make the necessary investments to move into the future

Technology is key to our future success...
Our challenge

• Maintain and improve our technology and operations infrastructure to ensure effective and reliable support for our current business

• Innovate and invest in our future solutions to ensure success in a changing world
Technology vision and strategic plan
“The best way to predict the future is to invent it”

We must rebuild PBS and Public Media’s technology infrastructure utilizing innovative technologies and approaches in order to support the multi-platform business of today and build flexibility for Public Media in times of disruptive change.
Unified Media Supply Chain

Shared Business Tools: Workflows, Billing, Sales, Traffic, Dashboards, CRM

INGEST
- Submission / Review
- Content
- Metadata

PROCESS
- QC
- Post
- Transcode

DISTRIBUTE
- Library / Discovery
- Traffic
- Delivery
- Stream Factory
- File Factory

TRACK
- Nielsen
- Digital reporting
- EIDR

Core Systems: BPM, ESB, Glue, Monitoring and Control, BI, Reporting

Databases
- Programs
- People
- Rights
- Financials
- Metrics

Asset Mgmt
- Media Asset Library

Identity
- Security

Media Tools
- Transform
- Quality Control
- Move
- Transcode

Connectivity
- Storage
- Processing

Infrastructure: In House, Cloud, Disaster Recovery

Ports / Discovery / APIs / Interconnection

Authorized Users
- Passwords
- Access Management

Distribution
- Newscast
- Special Events

Consumer
- Internal
- External

Content Providers / Suppliers
- Producers, Post, Networks, Sales
Foundational Technologies

- Modern compute / storage / connectivity
  - On-premise and cloud infrastructure lay the groundwork
- Enterprise Service Bus (ESB)
  - Flexibly knit together numerous systems to scale and evolve
- Asset Management (DAM, MAM)
  - Center all tools around the media assets which are our business
- Business Process Management (BPM)
  - Build structured but flexible workflows for each lines of business
- Business Intelligence (BI)
  - Use data to comprehend and manage the state of the business
V6 Interconnection

(next talk for deep dive)
v6 Proof of Concept ‘14

• All stations invited!
• Volunteer registration link created
  • Info at v6 Kiosk
  • Posted on Connect & MyPBS
  • E-mail to be sent after TechCon
• Up to 20 sites will be selected
• Response on or before 4/18/2104
• https://www.surveymonkey.com/s/v6_PoC_14_Station_Volunteer_Registration
v6 Summary

• V6 is an enabling initiative
  • Enables fundamental changes
  • Enables new business models
  • Enables refocus on the core missions
T&O: Engineering & Operations
Looking Forward

• Service Management System
  – Leverage ITIL practices providing new tools for driving productivity, gaining meaningful metrics and empowering employees and customers

• Media Operations
  – Improve file based workflows for content delivery, packaging and distribution leveraging commodity and cloud infrastructure.

• Satellite Operations Center
  – Refresh PBS content playout and record systems.
T&O: IT / Development

Looking Forward

• Refresh aging underlying storage and network infrastructure to support broadcast and corporate operations

• Roll out ESB across NRT, Real Time, and DDMS systems

• Production launch of key system-wide tools and services including myPBS and DAM
DAM Digital Asset Management

• Phase 1, Marketing & Communications
• Future Phases, Enterprise-wide
• Benefits to Member Stations
  – Centralized searching for media assets of all types
  – Faceted search results for quick drill-down
  – Preview and then download files
• Benefits to PBS
  – Single system of record
  – Staff effectiveness; Reduces looking for same assets
  – Controls over “approved” and security policies re: rights
  – Structured workflows for common tasks
Thanks to our Sponsors!

• Platinum: Ericsson
• Gold: Imagine Communications, Miranda, & SES
• Silver: Aja, Aspera, Evertz, IBM, Level 3, & Myers
• & thanks also to our Exhibitors!
Thank you to our Committees!

- ETAC: Engineering Technology Advisory Committee
- TAC: Traffic Advisory Committee
Congratulations to our 2014 TechCon Scholarship Winners:

Lorne Campbell, Prairie Public Broadcasting – North Dakota, Chief Engineer

Bryan Fuqua, WTCI – Tennessee Valley, VP Technical Services

Marilu Hernandez, WUSF – Tampa, Florida, Traffic Manager

Eli Moulton, KEET – Eureka, California, IT Coordinator

Gina Peraldo, KNPB – Reno, Nevada, Certified Television Operator
SURPRISE! Connectivity Survey

Free TechCon Registration Winners:

Joe Glynn, Vice President of Engineering, WVIA, Pittston, PA
Steve Newsom, Chief Engineer, KBTC, Tacoma, WA

Connectivity Survey iPad Air Winner:

Bob Spain, Director of Engineering, Wyoming PBS
PBS Kiosks & Demos

- V6 demo
- myPBS
- NRT
- WARN
- PBS Digital
- all in the Exhibit Hall

April 3, 2014
Interconnection v6 Kiosk

Live Terrestrial NPS Delivery
Terrestrial File Sharing
Cloud Services
in the Exhibit Hall
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Thank you!

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