IPTV Trial Update – Fall 2009

Walt Magnussen
Shaun Illingworth
About Move Networks

- Company launched in 2006
- Tier 1 Venture Capital backing – Hummer Winblad, Benchmark, Steamboat (Disney)
- Tier 1 Strategic Investors – Microsoft, Cisco, Comcast, Level 3
- Founders are former Novell founders (Drew Major chairman invented Netware) Deep networking and caching background
- Acquired Inuk Networks in April of 2009
- Move Networks has over 70 million plug-ins installed (mostly US) adding over 100,000 per day
- Customers include major networks, sports sites and live events
- Move delivers over 50 live events a month
Move offers a wide array of products and services for bringing Television to the IP networks
- VOD, Live, Linear

With Move, our customers can deliver a broad-based set of products and services
- Web TV, Live Events, IPTV, Wireless

Over all popular consumer platforms -
- PC/Mac, vSTB, STB and CE Devices (mobile, Connected TV’s, Netbooks, etc.)
Move-Powered Broadband Video Leaders
ABC.com, one of Move’s original partners has leveraged our industry leading platform to build a brand focused video experience that has won numerous industry awards and continues to set record engagement numbers.

Key Takeaways:
- In May of 2008, ABC.com viewers consumed a record 815 Million minutes of content
- Users have streamed over 441 million episodes since launching in 2006
- First major broadcaster to make content available online in HD (July 2007)
- Flash UI with a Move Networks video playback rectangle

Press Reactions:
ABC.com won both the Webby and People's Voice awards for best broadband Website for its full-episode streaming video player.
Partner Spotlight: DNC

Move Networks partnered with Level 3 to provide a revolutionary live and on demand experience for the 2008 Democratic National Convention which was delivered in HD with multiple camera angles.

Key Takeaways:
- First public implementation of Microsoft Silverlight and Move Networks
- Viewed in over 116 Countries
- 80.4 minutes of average viewing time per viewer
- 350,000 hours of viewing time
- Average bit rate delivered at 1.2 Mbps
- Peak traffic of 60 Gbps

Press Reactions:
“But the most awesome (I have probably never used that word in seven years of this site) online video feed is on the official Democratic Convention site, on DemConvention.com site. It is in HD, and uses Move Networks’ plugin and using Microsoft Silverlight.” Rafat Ali, Paid Content & Washington Post
Network Delivery Options

- **Multicast**
  - Optimum solution for efficient delivery of fixed bit rate video over closed networks
  - Move experienced with multicast network configuration including Fast Leaves & Joins, Static Joins, Dynamic Bandwidth Reservation

- **Rate Adaptive**
  - Deep caching technology achieves multicast-like benefits
  - Streams adapt dynamically over different network technologies and in times/areas of congestion
  - Never any picture breakup, buffering, packet loss
  - Works perfectly over home WLAN networks

- **Move IPTV platform supports both delivery methods**
High Level Solution Overview

- Move provides a unique virtual Set-Top Box for PCs and Macs
- Supports both “traditional” MPEG2/4 multicast streaming but also is available with Move’s own rate adaptive streaming
- Move also offers full hosted wholesale solution, providing end-to-end IPTV platform
- Rate adaptive streaming can be deployed efficiently on closed telco networks using caches or over open Internet using CDNs
Why Linear TV on a PC?

- Fit with the student lifestyle
  - PC replacing TV as primary entertainment device
  - Multi-tasking is normal
  - Consumption on MY terms…

- Supporting data
  - The Diffusion Group (TDG) recently studied the extent to which broadband and Pay TV subscribers would actually pay to have their linear TV line ups available on their PCs.
  - The results are persuasive: approximately 43% of consumers are to varying degrees interested in such a TV-to-PC service.
  - And this coming from an older demographic!!
Comcast will begin its technical trial of On Demand Online with approximately 5,000 customers from across the U.S. in the coming weeks – the first national trial of its kind.

A major focus of the trial is to test Comcast’s new “authentication” technology, which will allow Comcast customers to receive the same content online for free that they subscribe to on TV.

The service will utilize a simple log-on system for streaming content and, in the future, will allow for download content to go. The On Demand Online service will roll-out in phases, adding new features, functionality and content over time to provide consumers with a new way to watch television.
The above screenshots highlight the fundamental difference between WebTV solutions and IPTV (or 'proper' television) interfaces. The limitation is due to their inability to render the user interface over the streaming content in a performant manner.
The igloo virtual STB presents a true television interface by providing complete control over the blending of both video and graphical planes to the browser based client side middleware component.
Linear TV

- Linear Broadcast
  - Channel Navigation
  - Now & Next
  - Programme Information
  - Reminders
  - Full EPG
  - Subscription channels
  - Parental control
Video on Demand (VoD)

- VoD
  - Search Facility
  - Free/Pay VoD
  - Full transport controls
  - Bookmarks
  - Parental Controls
  - Library
Student Radio

- Move is now ready to welcome more stations onto the platform. Please ask the Radio Stations to get in touch.

- “Delivering Student Radio to Freewire” solution description document available. Key steps include:
  - Playout existing radio stream as MPEG2 Transport Stream using VLC
  - Stream locally on agreed multicast address
  - Provide multicast address so EPG can “point” at local stream
  - Provide excel schedule and basic channel info (logo etc.) to Move for EPG
University and Student TV

- Now the MPEG2 capabilities of the PAD build has been rolled out to users, Local Playout of a University of Student Union channel is achievable.

- Move’s focus has been:
  - Documenting a Playout system that is stable and low cost. This has required significant testing to find the optimum settings for the GA builds of VLC.
  - Select a video format that is suitable for broadcast over a LAN, can be encoded with common tools (Adobe Premiere Pro, Apple Final Cut Pro) and has shelf-life for the future (DVD Compatible).

- Preview solution description available ready for testing...
Trial Update
Internet2-TAMU IPTV Architecture
Participants to date

Iowa State University  Texas A&M University
University of Central Florida  University of Pennsylvania
Washington State University  Pennsylvania State University
the Ohio State University  University of North Carolina - Wilmington
Indiana University  University of Wisconsin - Madison
University of Arizona  University of Iowa
MAGPI  Gustavus Adolphus College
LONI  Utah State University
MERIT  Case Western Reserve University
NJEDge  Georgia State University
NYSERNet  California State University
University of Missouri - Kansas City  Portland State University
Northwestern University  Rutgers University
Motivating Factors

- New construction – building new apartment buildings. Desire to actually do triple play, voice, data and video over IP.
- Replacement of aging infrastructure – old coax with new?
- Expansion of services and channels.
  - Additional channels, premium content
  - PPV
  - VoD
  - University generated content
  - Live events
IPTV Advantages

- More cost effective distribution
  - New buildings with Broadband trunk cable
    - $12,000 trunk installation
    - $8,000 distribution

- Specialized programming
  - International languages
  - Student programming
  - Research Programming
  - Sports events

- Financial benefits to a network centric model
  - Lower CAPEX – network ingest done centrally
  - Lower OPEX – no dedicated cable plant resources
Broadcast Networks

- Working with SecureMedia, Internet2 and broadcasters to provide technology and service assurance
- Several meetings, many calls, hoards of emails with all the major networks
- Lesson learned
  - Define “quick”
  - “Who else”
  - $$$ talks
  - Security concerns remain
- But we are very, very close.....
Next Steps – *Getting on with it!*

**VALIDATION**

- Will proceed with self validation of all participant networks to receive/present multicast stream
- Use VLC for the test
- Goal to ensure multicast is working correctly from TAMU, across Internet2 and to your institution
  - You should see a 2Mbps MPEG2 Transport Stream containing H.264 Video and MPEG1 Layer 2 Audio.
- The source address of the multicast will be provided.
- It is worth testing whether the streams can be viewed at both the border of the network (closest to Internet2) and deep within the network (representing Halls of Residence).
- Please provide feedback on your Validation results to: [IPTVtrial@movenetworks.com](mailto:IPTVtrial@movenetworks.com)
Next Steps – Getting on with it!

STARTING THE TRIAL

- Following confirmation that your interconnection and campus network is IP multicast ready, we can proceed with the actual trial of linear IPTV services with a limited set of channels, adding whenever possible.

- As discussed previously, the trial requirements include the university identify a dedicated project management resource to act as Single Point of Contact (SPOC) throughout the trial.

- The SPOC will be responsible for trial deployment, monitoring server deployment and all campus-side support questions. Move Networks will assign a Project Manager for the Internet2 trial.

- TAMU has assigned a project coordinator for this fall semester. joelchateau@gmail.com

Demonstrating the service to broadcasters

- Visual statement of the potential and the viability of the network as a linear transport service.
Discussion

How can we collectively Internet2, RONs and Member Institutions, Member suppliers) be more vocal.