Webcasting on a Budget

Presented on May 25, 2012
by Andrew Porter

at GAiN 2012

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About Me

- I currently manage the Information Systems department at the Seventh-day Adventist Guam Clinic

- Before moving to Guam I worked as an ISP Network Engineer and helped launch the United States' first gigabit home Internet service in Chattanooga, Tennessee

- I volunteer with the communications department at Collegedale Community Church where I designed and implemented a live video streaming solution

Introduction

- Why stream?
  - Reach people around the world
  - Sick or homebound members
  - Stay connected with members after they relocate
  - Sharing tool
  - Overflow seating
  - Friends and family who can't attend in person

Introduction

- What to stream?
  - Church service
  - Sabbath school kids programs
  - Weddings, funerals, seminars, baptisms, dedications, etc

Introduction

- What do you need to get started?
  - Internet connection
  - Camera
  - Encoder
  - Stream hosting

Where we are Going

- Defining requirements
- Hardware & switching
- Encoding
- Streaming server software
- Hosting
- Players for every screen
- Statistics
- Archiving

Defining Requirements

- Budget
  - Low: $200
  - Medium: $1500
  - High: $30,000+
- Quality
  - HD or SD
  - Bitrates
  - Codecs
    - Windows Media
    - H.264 video with AAC
- Quantity
  - How many viewers?
  - How much bandwidth?
  - What playback devices?
- Logistics
  - Crew size and skill level
  - Avoid being a distraction?

Defining Requirements

- What we chose
  - Easy to operate with 1-2 volunteers and minimal training
  - Started small to see if there was enough demand
  - Initially went with a medium budget option
  - Received donations and upgraded over time to improve quality and workflow
  - Purchased cameras with HD support for future compatibility, but stayed with an SD workflow to save money
  - Decided against manned cameras to minimize distractions during the service
  - Chose a hosting option with very low minimum cost commitments and the ability to scale

Hardware & Switching

- Low cost
  - Smartphones
  - Netbooks / Laptops with a webcam
  - No switching
- Medium cost
  - High performance computer
  - Multiple home video cameras
  - Software based switching (Wirecast)
    - Switching, Titles, Overlays, etc
- High cost
  - HD capable PTZ cameras with joystick control (Vaddio)
  - Purpose built appliance (NewTek)
    - Switching, Titles, Overlays, etc

Encoding

- Software Encoders
  - Web based
  - VLC
  - Microsoft encoders
    - Windows Media Encoder
    - Expression Encoder 4
  - Adobe Flash Media Encoder**
    - AAC codec not included
  - Wirecast
    - H.264 & AAC codecs included
- Hardware Encoders
  - Blackmagic Design H.264 encoder
  - Integrated with Newtek appliance
  - Many others

Streaming Server Software

- Included as a feature with some encoders & services
- Windows Media Services
- Adobe Flash Media Server
- QuickTime Streaming Server
- Darwin Streaming Server (open source QuickTime)
- Red5 (open source Flash)
- Wowza
  - Stream once, view on multiple screens in multiple formats

Hosting Options 1/4

- "Free" Hosting Options
  - uStream
  - Justin.tv
  - StreamWebTown / FlashWebTown (free demos)

- Pros
  - Free
  - Simple to use

- Cons
  - Advertising
  - Stream quality
  - Lack of control

Hosting Options 2/4

- Host it yourself
  - On site or at a dedicated datacenter
  - Streaming server software
    - Included as a feature with some encoders
    - Windows Media Services
    - Adobe Flash Media Server
    - QuickTime Streaming Server
    - Darwin Streaming Server
    - Red5 (open source)
    - Wowza

- Pros
  - Maximize control
  - No extra hosting charges

- Cons
  - Bandwidth limitations
  - Up front software license costs
  - More complicated to maintain & update

Hosting Options 3/4

- Low cost, scalable cloud-based stream hosting
  - Wowza Media Server on Amazon EC2

- Pros
  - Low monthly cost
  - Very scalable
  - Pay only for actual bandwidth usage
  - Only turn on the server when you need it
  - Bundled licensing & pricing

- Cons
  - Can be complicated to set up and operate
  - Difficult to troubleshoot if something goes wrong
  - Unpredictable monthly cost

Hosting Options 4/4

- ● Use a hosting provider
  - – http://www.sealingtime.com (Adventist ministry, Wowza hosting for $15 monthly)
  - – http://www.influxis.com/ (Simple plans, online package builder)

- ● Pros
  - – Predictable monthly cost
  - – Server is always on
  - – Bundled licensing & pricing
  - – Support is available when needed
  - – Easier to set up & operate

- ● Cons
  - – Higher monthly cost
  - – Limited number of connections, harder to scale automatically
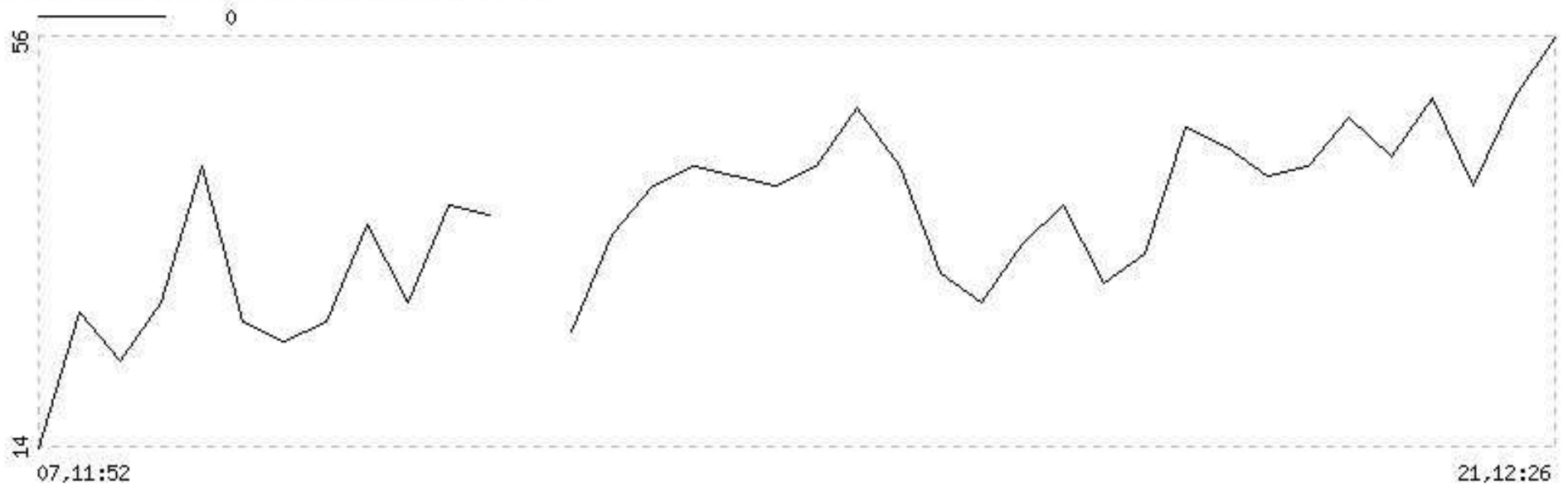
Players for every screen

- JWPlayer
  - Dynamic bitrate switching
  - HTML5, iPhones, Flash and more
  - Works well with Wowza which outputs multiple stream formats from a single source encoder
  - Very configurable
- Flowplayer
- Custom development
  - See Wowza documentation for examples to help you get started

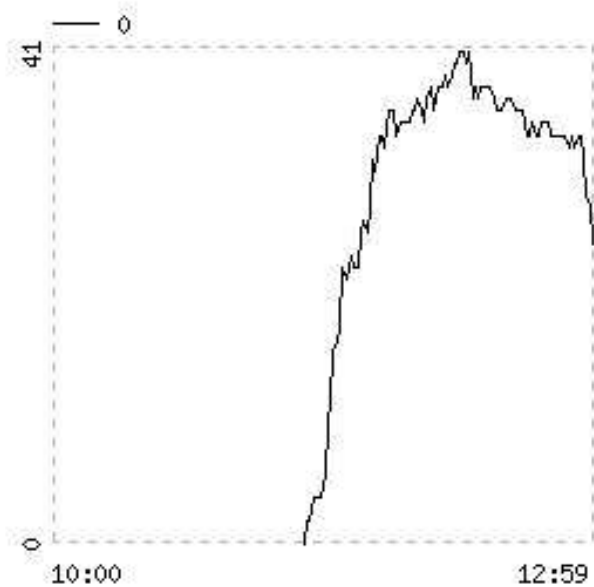# Statistics & Feedback

- Why count?
  - See if the ministry is reaching people
- How to count
  - Wowza bundled statistics
  - Custom scripts
  - Hosting provider stats
    - Web site
    - Streaming provider
- Feedback
  - Live feedback regarding broadcast problems
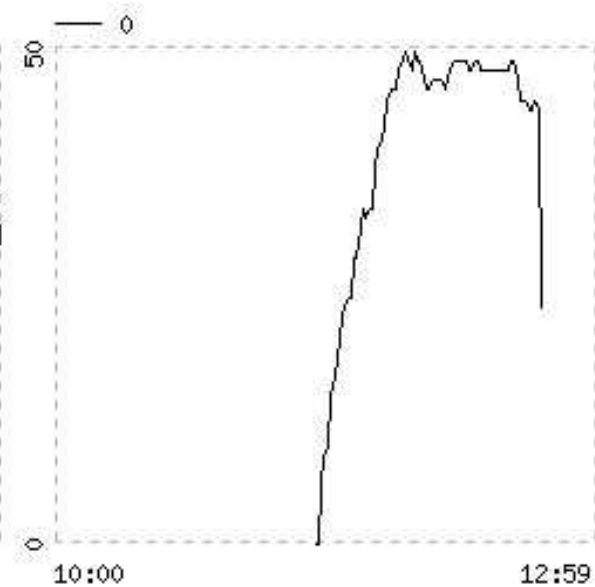 - Interaction during the event
  - Social media

Webcast Stats

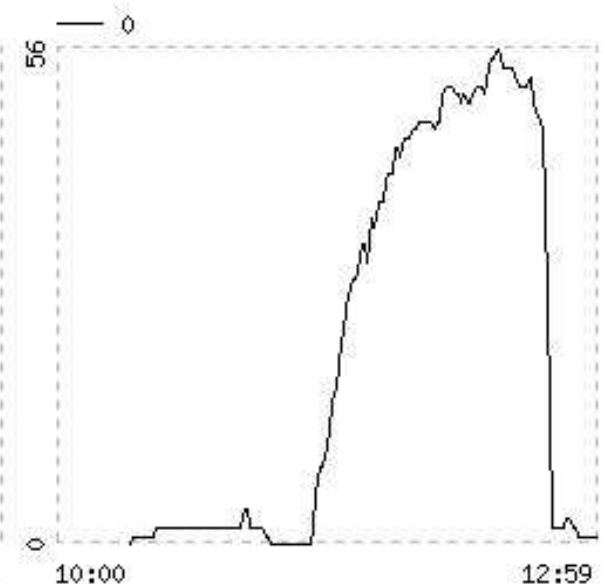Summary of max connections from each week:

56

14

07,11:52   21,12:26

2009-11-07:   2009-11-14:   2009-11-21:

41   50   56

10:00   12:59   10:00   12:59   10:00   12:59

Archiving

- Recording formats
    - H264 MP4
- Storage sprawl
    - Retention policies
- Where to post the videos?
    - Amazon S3
    - Your web or streaming hosting provider
    - Vimeo
    - Other CDN or media asset management tool (AWR)
- How to index & podcast
    - SermonSpeaker Joomla plugin
    - NetAdventist
    - Write your own
- DVDs
- Backups

Other things to consider

- Copyright
    - http://streaming.ccli.com/
    - http://www.copyrightsolver.com/services/worshipcast
- Audio mixing and inputs for streaming
- Projector display on site (closed circuit)
- Presenter content (slides, scripture, movies)
- Physical installation (mounting, cabling, work area)
- On going support & maintenance
- Staff training & scheduling

Questions?

For more technical details and to download this presentation visit my website at:
http://headbackup.com

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