ConferenceXP

José Feghali – TCU School of Music, with Fred Videon – University of Washington

- Video conferencing with compressed or uncompressed audio
- Independent compression settings for video/audio
- Sync audio/video with audio buffers’ settings
- SD/HD video
- Video from webcams, DV and devices recognized by Windows
- Multi-client capability via Reflector service
- Presentation, chat, media playback, local screen streaming, shared browser, classroom presenter
- Archiving ability through Archive Service
- Diagnostic service
- Now **Open Source**!
- Wiki and users’ forum (a lot of info on the Wiki)
- Works in Windows XP, Vista, 7 and 8
- Venue, reflector and archive services can be hosted locally
- Encryption capabilities

**Recent experiments:**
- HD video from webcams (including MJPEG, H264)
- HD 1080i video with Blackmagic i/o
- Multi-camera from one computer
- X264 VFW, LAV codecs (and some VP8 – high CPU)
Venue service:

Venue Service: http://venues.confxp.pnw-gigapop.net/venueservice5
Audio/Video Settings

Audio/Video Settings

- Video Settings:
  - Select camera(s):
    - Decklink Video Capture
    - FaceTime HD Camera (Built-in)
    - Logitech HD Pro Webcam C920

- Audio Settings:
  - Sound playback:
    - Speakers (Cirrus Logic CS4206A (AB 29))
  - Sound recording:
    - Microphone (Cirrus Logic CS4206)

- Advanced Settings...
- Test Video

- Window Layout:
  - Tiled
  - Four-way
  - Full screen

- Resource Utilization:
  - Machine CPU: 0%
  - ConferenceXP memory: 59 MB

- Troubleshooting Log...

- Close

Logitech HD Pro Webcam C920 Properties

- Video Proc Amp
  - Camera Control
    - Zoom
    - Focus
    - Exposure
    - Aperture
    - Pan
    - Tilt
    - Roll

Advanced Video Settings: Logitech HD Pro Webcam C920

- Configure Camera and Video Stream
  - Camera...
  - Video Format...

- Additional camera configuration options (if available)

- Enable Video Compression
  - Key frame every 2 seconds
  - Bit rate: 1000 Kbps

- Restore Defaults
- Apply

Capture Properties

- Stream Format
  - Video Standard: None
  - Frame Rate: 30.000

- Compression
  - Video Format:
    - H264
  - Frame Rate Interval:
  - I Frame Interval:
  - P Frame Interval:

- Output Size: 1920 x 1080 (default)
Audio Advanced Settings

- Buffer size – critical for uncompressed audio
- Also used for synching video/audio (metronome with light)
- Sampling Rates above 48 KHz might not work (hardware)
- Disable FEC for uncompressed audio/video
- Reflector Service – non-multicast users (but is multi-client even if Reflector server is on unicast)
- May also use IP to IP instead of reflector service (Actions menu, main window)
Windows notes:

- Good idea to use a dedicated computer. Intel i5 or better recommended
- Disable search/indexing and any other services on background that might run up CPU/resources
- Some virus software may also interfere
- Use High Performance power setting
- Advanced System Care’s Turbo Boost may help
- Check msconfig settings or use autoruns from Sysinternals
- Make backups of the system registry regularly but **definitely** before installing new codecs and/or dealing with filters/merits or anything else that might affect the registry
- MBPro or other Mac with Thunderbolt, using bootcamp. Other laptops with TBolt coming into the market. Some motherboards as well although there are some issues
- Good video card can be helpful especially if using more than one screen
- Helpful utilities:
  - GraphEdit – GrapheditPlus – GraphStudio (?) Register proppage.dll with regsvr32 (in elevated command prompt)
  - GSpot (run as Administrator)
  - Sysinternals
  - Task Manager for CPU monitoring
  - TCPOptimizer (especially for XP)
  - Iperf, traceroute, ping, netsh, ipconfig, etc...
- CXP works over Wi-Fi, but watch your bandwidth
- Wired bandwidth appears to “top out” around 40-50 Mbps
HD Video (Experimental)

- 1080i and use of other software codecs (aside from default WMV) require special version of CXP and config file editing (webcam HD should work with release version)
- Webcams – use “generic” USB Video driver
  - Go to Windows Device Driver, right-click on camera under Imaging Devices, Update Driver, Browse my computer..., Let me pick..., choose USB Video device
- When using MJPEG/H264 native (hardware) codecs, disable Video Compression

- Logitech C910 – native MJPEG        Logitech C920 – native MJPEG, H264        MS LifeCam Cinema - native MJPEG

- Frame rate in Capture Properties settings display can be deceiving (i.e., 30 FPS sometimes isn’t)
- Disable Low Light compensation in Video – Advanced Settings, Camera, Camera control (and auto exposure?)
- Always double-check with two computers and disable FEC in audio/video settings (forward error correction)
- 1080i from HDMI/Component/SDI
- Blackmagic Intensity Shuttle/Extreme (Thunderbolt - USB3 can be difficult to work properly)
CODECS

- Default WMV/WMA audio
- WMV still works (?) with HD!
- X264, LAV and the future??

X264 VFW sending:
(best settings so far)

[Diagram of X264 VFW configuration window]
• LAV codec receiving – default values. MSoft DTV default codec works (?) with H264 but has higher latency
• Tests best done with two computers. Do not trust “Test” button!
• WSAEACCES error - disable the Windows Media Player Network Sharing service
• X264 VFW and “normal” ffmpeg haven’t worked as decoders yet
• Blackmagic Design hardware – two types of drivers, WDM and Decklink
  o Seems to work best with WDM driver, but also try Decklink
  o Sometimes need selecting/unselecting (and/or highlighting) driver to make it work
• Depending on computer setup, may need to set Merit high for chosen codec filters and/or lower Merit on others
• GraphEdit – tool for looking at filter. Need proppage.dll (and evrprop.dll?)
• GraphEdit, proppage.dll and evrprop.dll available in Windows SDK
• Merit - used GraphEdit / GSpot with admin rights. DO NOT use the Filmerit utility (Glagla) with Windows 7!!

**Audio Hardware**

• Anything (almost…) recognized natively by Windows directshow. ASIO not recognized
• RME (Fireface), Sound Devices (USBPre2), MAudio Transit, Yeti, Zoom H2, other USB/Firewire
• Webcam mics are generally of inferior quality

• Drivers can be an issue – always try the newest drivers first
• Haven’t succeeded using Blackmagic for audio input as yet (driver issue?)
• Dynamic mics are best for echo attenuation. Best dynamic mic I have used is the Sennheiser MD441
• If one-to-one or one-to-many, use headphones
• For best quality, wired headphones. Some good ones are Sony MDR-V6 (MDR-7506) - closed type; Audio Technica ATH-AD700 (huge but good) - Koss PortaPro original (!!) and Sennheiser - open type
• Logitech H760 wireless headset for non-critical work
• Best portable stereo audio interface I have used – USBPre 2. Very high quality/volume, USB powered

Links:

http://cct.cs.washington.edu/
http://cct.cs.washington.edu/conferencexp/forum/
http://sourceforge.net/projects/x264vfw/
http://code.google.com/p/lavfilters/

EMAIL: j.feghali@tcu.edu

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