

# Towards Higher Quality & Lower Costs

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# Distributed Classroom



My Services (Passport, Messenger, Calendaring)

## Learning Venues

### Conferencing

- WM codecs
- Low Latency
- Multicast

### Workspace

- PowerPoint
- Ink
- *Shared Apps*

### *Whiteboard*

### *Assessment*

### Partners

- WM Transcoding
- MBONE Transcoding
- Student Experience

Multicast RTP

Network Diagnostics

Archive / SQL Server

Internet2

# Demos

- DISC Conferencing
  - Higher Quality
  - Easy to use
- VMR Player
  - Video over video
  - Image over video
- VMR Cube
  - Video rendered on 3D object

# Lower Costs

- **Integrates the system on one computer**
  - Commodity hardware
    - Dual Pentium IV
    - NVIDIA Graphics
    - 1394 Cameras (quality, one wire, capability)
  - Software intelligence
- **Web Services with complex systems centrally managed**
  - DISC Node is one simple install
  - Centralize the complexity
- Personal Nodes under \$1.5k
- Conference Nodes under \$5k
- Classroom Nodes ~\$25k (mostly projectors & audio)

# Current Partners

- Argonne National Labs – MBONE compatibility
  - Transcode to MBONE tools (h.261, loss of quality)
  - RTP implementation compatibility
- Brown University – Tablet PC Student Experience
  - Outside of the classroom, how does university education change?
  - Assuming every student has a Tablet, what can we do in the classroom?
  - Co funded by Tablet PC group
- University of Washington – Windows Media Transcoding
  - Transcode to Windows Media network transport
  - Distribute off Windows Media servers
  - Limited Persist to ASF (long term storage)

# Takeaway -- Today

- Windows XP
  - Video Mixing Renderer
  - 1394 Camera Support
- DirectShow / Windows Media
  - Easy to use API that handles capture, rendering
  - High quality, x86 optimized codecs
- <http://Research.Microsoft.Com/Downloads>
  - DISC Conferencing application
    - 320x240 & 640x480
    - Low artifacts, low bandwidth
    - Simple to install & use
    - RTP class binaries

One Box Works

# Takeaway -- Futures

- Conferencing Framework w/ BSD licensed source code
  - Conferencing classes
  - Managed DirectShow classes
  - RTP classes
    - Improved FEC for better bandwidth efficiency & higher loss tolerance
  - Documentation & Sample code
- Windows Media Codecs
  - Latency & bandwidth & quality improvements
- Archive & Playback from SQL Server
- Distributed PowerPoint
  - Tablet PC integration (ink, wireless)
- Distributed Whiteboards

# Future UI

The image displays a Windows XP desktop with a futuristic user interface. The desktop background is a solid blue color. In the center, a large window titled "My Group" is open, showing a conference for "CSE 584". The conference window includes sections for "Announcements" (with a link to "Assignment #4"), "My Conference" (for "CSE 584 Tuesday Lecture"), and a list of participants: Eric Carlson, UW Room 203, Eric Carlson, and Brown. Each participant has a profile picture and a "Hide" or "Mute" button. At the bottom of the conference window, there is a "Leave the conference" button.

Surrounding the central window are several "My Services Bar" panels on the right side of the screen:

- My Services Bar:** Shows the user's name "Eric Carlson" and a profile picture.
- My Presence:** Shows the user's status as "Sleeping in lecture".
- My Location:** Shows a map of Boston.
- My Contacts (8):** A list of contact icons.
- My Inbox (3):** Shows "CSE 584 Community" with "3 new announcements", "1 active conference", and "5 members online".
- My Thermo Lab:** Shows a small video feed of a lab and status indicators: "103 F" and "50%".
- My Zoo Tycoon:** Shows a small game window.
- My Top 10 Lists (3):** A list of top items.
- My Polls (7):** A list of polls.
- My Alerts:** Shows alerts such as "The CSE 584 Tuesday Lecture has begun" and "Dave Mitchell is nearby".

At the bottom of the screen is the Windows taskbar, which includes the Start button, taskbar buttons for "Adobe Photoshop" and "Windows Messenger", and the system tray showing the time as "3:33 PM" and various system icons.

# For More Information

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