Outline

• Overview of the Center
• Projects & Technologies
  – ConferenceXP
  – Classroom Presenter
  – Archiving & Playback
• Deployments
  – Professional Masters Program
  – Latin American Virtual Institute
• Questions/Discussion
Center for Collaborative Technologies

- Funded by Microsoft Research External Relations and Programs
- Established in July 2007
- 3 year duration
- http://cct.cs.washington.edu
Center for Collaborative Technologies: Goals

- Investigate education and other collaborative scenarios
- Extend and maintain the ConferenceXP platform
  - New Development
  - Innovative Deployments
  - Build the community of users and developers
ConferenceXP

- Platform for real-time collaboration
- High quality, low latency multipoint conferencing
- Targeted for standard PC and high quality network
- Works with commodity cameras and audio equipment
- Built-in collaboration tools including presentation, whiteboard, screen sharing, video playback, chat
A Brief History of ConferenceXP

• Project began at MSR in 2001 as DISC
• Successful deployment for distance learning, Spring 2003
• First 4-way distance learning deployment Autumn 2004
• July 2007, CCT Established
• August 2008, CXP 5.0 released
System Software Vendor’s View

- TP is partly a component product problem
  - Hardware
  - Operating system
  - Database system
  - Application Server

- TP is partly a system engineering problem
  - Getting all those components to work together to produce a system with all those “statics”.

This course focuses primarily on the Database System and Application Server.
ConferenceXP Services

• Services included:
  – Venue Service: Virtual meeting spaces
  – Archive Service: Conference archive & playback
  – Reflector Service: Unicast/Multicast bridge
  – Diagnostic Service: Collect and report loss rates and other statistics

• Hosted Services vs. Site Local Services
ConferenceXP is a Shared Source Platform

• Provides a great platform for research in collaborative environments
  – APIs designed for extensibility
  – .Net Framework shortens development cycle
  – Includes rich AV device support

• Provides a proven platform for distance learning and distributed meetings
  – Existing tools support integrated TabletPC based presentation, archive post-processing and integrated archive playback
ConferenceXP Downloads

• Binary:
  – http://cct.cs.washington.edu

• Source:
  http://www.codeplex.com/ConferenceXP
Classroom Presenter

- TabletPC-Based Distributed Presentation System
- Instructor navigation and annotation on local and remote displays
- Students can contribute to class using digital ink on instructors slide
- Also fine as a stand-alone presentation system
- Open source license
Classroom Presenter
Multicast CXP Archive Service

Audio/Video (multiple sites)

Classroom Presenter
Instructor Tablet

Classroom Presenter Students & Projected Displays (Multiple Sites)

Archiving Schematic

• All devices use CXP Multicast Networking
• CXP Archive Service provides a simple way to collect all classroom activity
• Data is automatically time stamped and stored in a database
Future Work: Port WebViewer to Silverlight!
Deployments: Professional Masters Program

• Site-to-site courses between UW and Microsoft since Winter 1997
• Master’s level courses
• Goal: interaction across sites
  – Approximate single classroom
• Using ConferenceXP & Classroom Presenter since 2003
Basic PMP setup (2 sites)

CXP

UW

Video cameras
Audio
Video Displays
Speakers

PMP VENUE

Archiver

Microsoft

Video cameras
Audio
Video Displays
Speakers

Student Tablets

CP3 Display
CP3 Instructor
CP3

Student Tablets

CP3 Display
PMP 4-Way Courses

- Quarter-length classes between UW, UCSD, UC Berkeley, and MSR
- Met the originally stated goal for ConferenceXP

Courses
- 2004: Public Policy
- 2005: Cyber Security
- 2006: History of Computing
UW – Pakistan, Spring 2008

• Masters class
  – University of Washington
  – Lahore University of Management Science
  – Microsoft

• Computing for the Developing world
3-way setup for UW, MS, LUMS

- Microsoft
- PMP Venue 1
- CP3
- CP3 Server
- UW
- PMP Venue 2
- CP3
- LUMS
- Archiver
Internet in Pakistan

- Facts of life in the developing world
  - Expensive International Bandwidth
  - No real peering points
  - Internet used over dialup
  - Poor "Scratch card" provisioning
Classroom Activities

SMS Applications (Homework 3)

Country  Paraguay  Country  Guatemala
Domain  Cattle Ranching  Domain  Generic Internet Queries
Problem  Cooperative communication  Problem  "Instant" concierge, operator assistance

What could go wrong?

- What are the potential difficulties with a large scale PDA based survey?
  - Power supply
  - Usability - training may be needed
  - Bias toward the technology (too sophisticated)
  - Crash can cause data loss
  - Language - is local language available?
  - Stealing of the device
  - Maintainence - SW update and HW repair

How has cell phone usage increased over time?

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Identify three potential Kiosk applications
Rate commercial potential and social benefit

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Project Results

• High connectivity 9 out of 10 classes
  – One lecture originated from Pakistan
  – Only failure was on the UW-Microsoft Link (which also brought down UW-Pakistan)

• Some early audio issues

• Participation of students from Pakistan
  – Student submissions
  – Questions and discussions

• Multiple rounds of audio communication
LATAM Virtual Institute

- Latin American and Caribbean Collaboration for ICT Research
- Shared Seminars:
  - University of Washington
  - University of Chile, Santiago, Chile
- Spring and Autumn 2008
- Network reliability not yet assured
Key Lessons for Deployment

• Participants must have incentive for a distance course
• Instructor must make an effort to create multisite interaction
• Active participants at remote site help
• Time zones and scheduling are major issues
Resources & Contacts

• CCT Website/Wiki
  cct.cs.washington.edu

• Announcements Email List
  cct-announce-request@cs.washington.edu

• Contacts:
  cct@cs.washington.edu
  fred@cs.washington.edu
  anderson@cs.washington.edu