

ConferenceXP Update: Development and Deployments

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In July 2007, Microsoft Research External Research and Programs¹ announced the creation of the Center for Collaborative Technologies at the University of Washington². The center is a three year project focusing on the ConferenceXP Platform, including continuing development, deployments and support.

In this talk we will discuss the work conducted by the Center for Collaborative Technologies during its first year, including the ConferenceXP 4.1 release, a set of current and near-term development directions on the path toward ConferenceXP 5.0, and a set of innovative ConferenceXP deployments.

ConferenceXP Background

ConferenceXP is a shared source platform for real-time collaboration which was started at Microsoft Research in 2001. It includes a set of built-in capabilities for payloads such as audio, video, presentation, screen streaming, shared browser, and chat, and it provides APIs to enable other real-time collaboration capabilities to be added as extensions. The platform also includes several services which support functions such as virtual meeting spaces, conference archiving and unicast tunneling. Since 2003 there have been numerous successful deployments of ConferenceXP for distance learning and distributed meetings.

Current Release: ConferenceXP 4.1

ConferenceXP 4.1 was released in December 2007. The significant new features included in this release are:

Localization: This release includes revisions to the source which will make it easier to create new language translations going forward. Strings throughout the projects were extracted and placed into separate resource files. These files can be compiled as satellite assemblies to implement versions localized for different languages. A Chinese version was checked by native speakers, and is included in the release.

Vista Support: Numerous installation and runtime issues affecting client and services running on Windows Vista were resolved. All components should now install and run with Vista UAC. The components that require administrative privileges will now prompt for elevation as required.

64 Bit Architectures: All of the ConferenceXP services are now available both in x86 and in x64 native versions. The 4.1 Client is a x86 build, but it will run on x64 using the WoW compatibility layer.

¹ <http://research.microsoft.com/erp/>

² <http://cct.cs.washington.edu>

Coming Soon: ConferenceXP 5.0

We are currently focusing our development efforts toward a July 2008 release date for ConferenceXP 5.0. The following work, in various stages of completion, is projected for this release.

Diagnostics: Multicast networking is the default for ConferenceXP. Unfortunately, multicast is notoriously flaky, and diagnosing network problems can be quite difficult. To help users understand networking issues, we have implemented a new ConferenceXP service called the Diagnostic Service. Using unicast, the service collects RTP sender and receiver reports from participating clients, and disseminates status updates back to clients by means of a web service. We have added simple ConferenceXP client UI modifications to provide quick visual indication of connectivity problems, and we have added a dynamically updating connectivity matrix.

Security: We have implemented a two-level approach to securing ConferenceXP sessions. The higher level “secure mode” uses a shared secret to generate a symmetric encryption key. The key is used to encrypt all RTP traffic for a particular venue. In the initial implementation, the shared secret is transmitted between participants out-of-band. The lower level simple security mode uses a password attached to a venue. Password-enabled venues are not truly secure in any real sense, but have utility in scenarios where it is desired to prevent venue use by mistake.

Supporting Heterogeneous Network and Client Capabilities: Clients in a single conference can have different levels of network bandwidth, and different system capabilities. Currently, all nodes are limited to the “lowest common denominator” for performance. We propose a mechanism to allow clients to control their inbound network bandwidth independently from other nodes. Our design employs multiple multicast groups for a single ConferenceXP Venue.

NAT-friendly Reflector: The ConferenceXP Reflector provides a bridge that allows unicast-only clients to participate in multicast sessions. For this release, we have enhanced the reflector to support clients behind network-address translation (NAT) devices.

High Quality Audio: Our user community includes members in the field of music who are interested in very high quality audio transmission. One individual in this community discovered ways to modify the ConferenceXP audio processing code to improve audio quality. We have incorporated these improvements and added UI support for new audio processing options.

ConferenceXP Deployments

We have found that among the best drivers of progress when developing new technology are real-world deployments. The following are some recent deployments with interesting or innovative features:

Shared Course with Lahore University: In Spring 2008 we conducted a shared graduate computer science course between the University of Washington, Microsoft, and Lahore University of Management Sciences. The primary challenge of this deployment arose from constrained network bandwidth to Pakistan. We were able to achieve good reliability and enough performance with the site in Pakistan to enable good interaction between the sites.

Music Instruction/Auditioning: Members of the ConferenceXP community have been exploring uses in the areas of remote music instruction and auditions. Sites involved include Texas Christian University, USC, The Julliard School of Music, and The New World Symphony. Very high quality audio is critical for these uses.

Latin American Virtual Institute: The Virtual Institute is a consortium of universities in South and Central America, the Caribbean, and in Mexico focusing on research in collaborative technologies. We have conducted an initial interactive research lecture using ConferenceXP between Seattle, and a Virtual Institute meeting held at the University of Chile. Other Virtual Institute members will soon be deploying ConferenceXP nodes, and we hope to build on this relationship.

ConferenceXP Workshop

We are planning to host a 1 day ConferenceXP workshop at the University of Washington in late July. We would like to encourage members of the Access Grid community to attend.