

Real-time Collaboration Using Exchange 2000 Server

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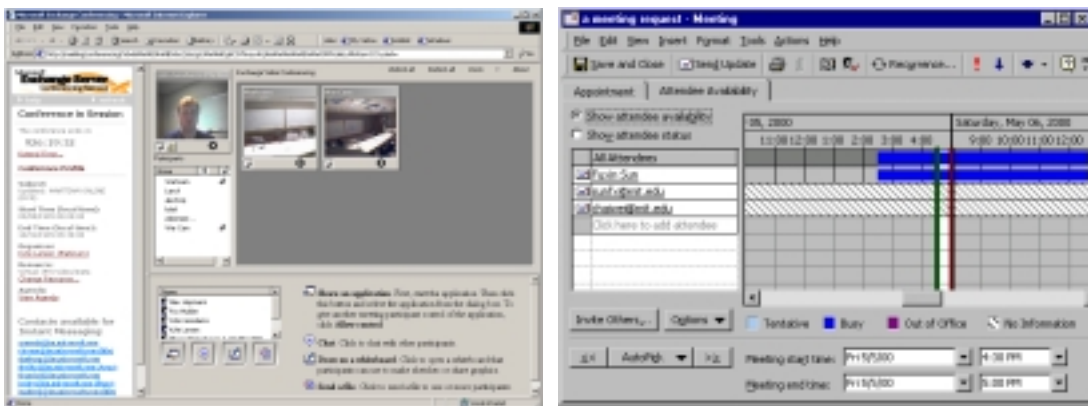
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Abstract: The current Virtual Engineering Initiative (VEI) solution to real-time collaboration has several limitations, such as that there is no multi-cast video conferencing supported, no instant messaging support, meeting schedule has to be made manually, and so on. This paper presents a feasible way to overcome these limitations and thus build a better real-time collaboration system.

Keyword: real-time collaboration, multi-cast video conference, Exchange 2000 Server



1. Real-time Collaboration and Current VEI Solution

1.1 What is Real-time Collaboration

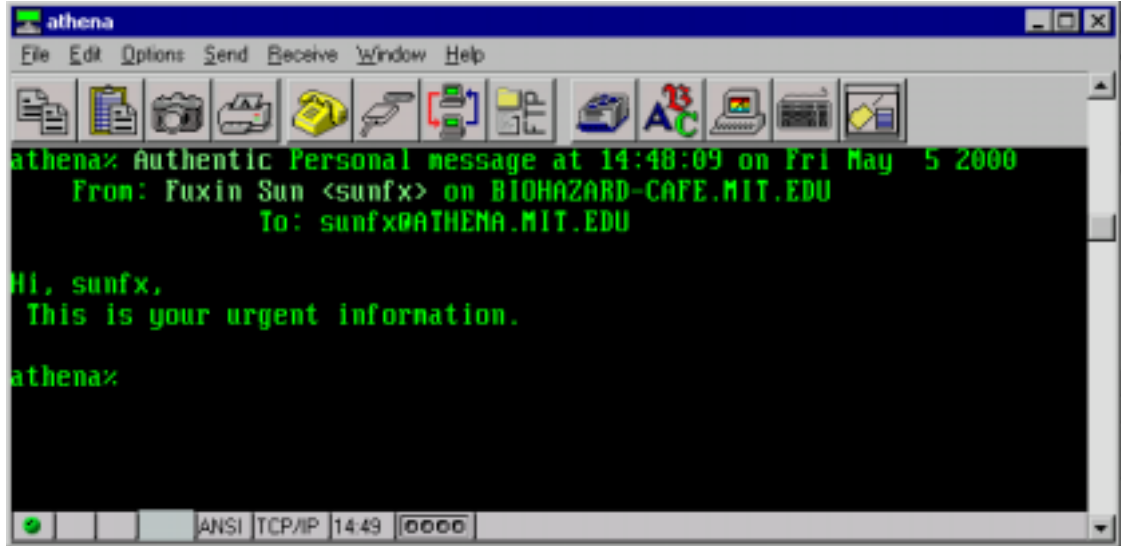
Real-time collaboration is the methods that allow users to share real time information through computer network, such as intranet and internet.

Real-time collaboration provides opportunities for virtual teams to meet, collaborate and work on documents across geographic boundaries.

1.2 Features of Real-time Collaboration and Current VEI Solution

1.2.1 Instant Messaging

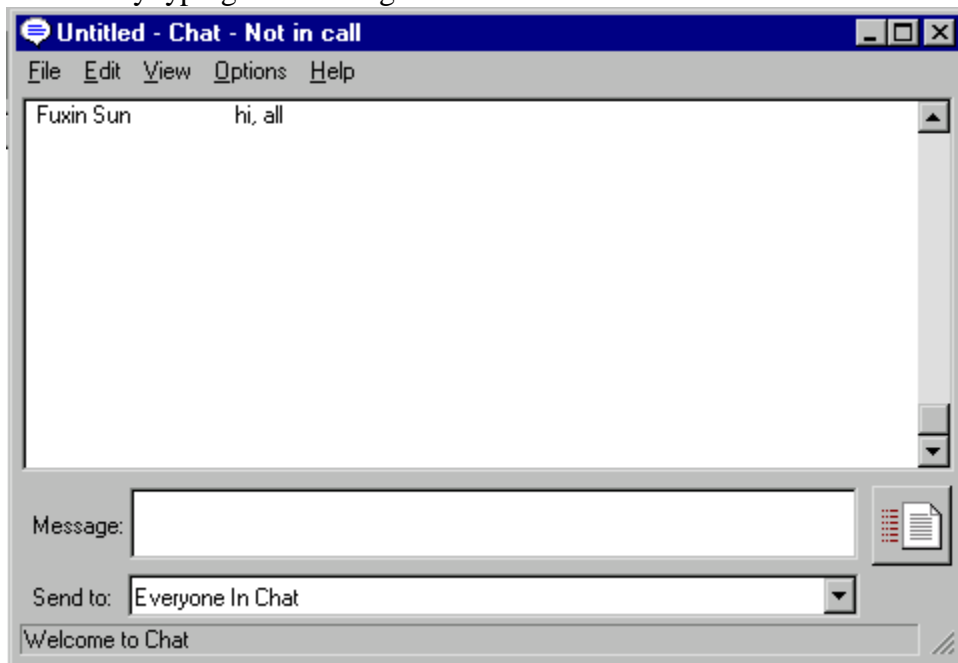
Instant Messaging allow user to deliver urgent communications that appear directly on another user's screen.



Current VEI Solution: Not available.

1.2.2 Chat

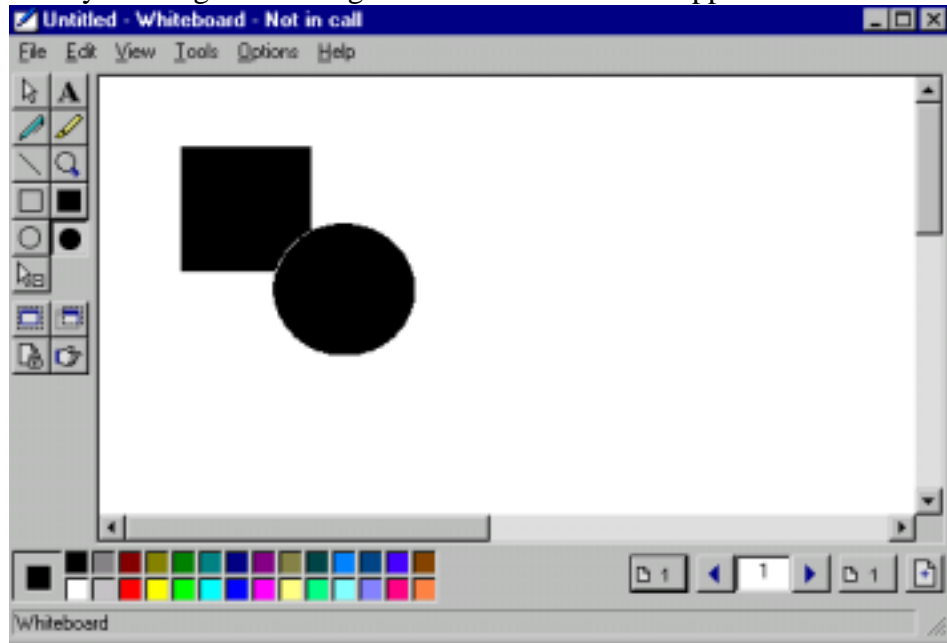
Chat is text-based real time information sharing, which allow users to share information by typing text messages.



Current VEI Solution: chat tool from Netmeeting.

1.2.3 Whiteboard

Whiteboard is image-base real time group information sharing. Users can share information by drawing and writing in a shared white board application.



Current VEI Solution: Whiteboard tool from Netmeeting.

1.2.4 Real-time Video Conferencing

Real-time video Conferencing is to share information by transferring real-time videos, which allows users talk "face to face" via internet.



Current VEI Solution: Netmeeting and [Webcast service](#)

1.2.5 Application sharing

Application sharing is one user can allow others to control his applications and view the result via network.

Current VEI Solution: Application sharing from Netmeeting.

2. Limitation of Current VEI Solutions

2.1 Netmeeting can only support peer-to-peer video sharing.

Netmeeting is based on H.323. The latest version of Netmeeting (V3.01) can not support multi-client video conferencing. The real-time video can only be shared between two conference participants, other conference participants can not share the critical video information at the same time.

Can we have a tool allow us to share real-time video between multiple participants?

2.2 Meeting schedule must be done manually

Currently, it is currently a problem to schedule meetings in a forum such as the 42v VEI group, which involves several companies. Our conference organizer has to send tens of emails to every attendee or phone them manually. More over, he has to track all the replies and adjust the meeting date accord to the response. It is difficult to settle a date especially if the meeting will have many participants.

Can we automate this procedure?

2.3 Instant Message Support

We want to send urgent information to others screen directly other than calling people via telephone. Can we support instant message within our virtual team?

3. Overcome the limitations -- Solution by Integrating Exchange 2000 Server

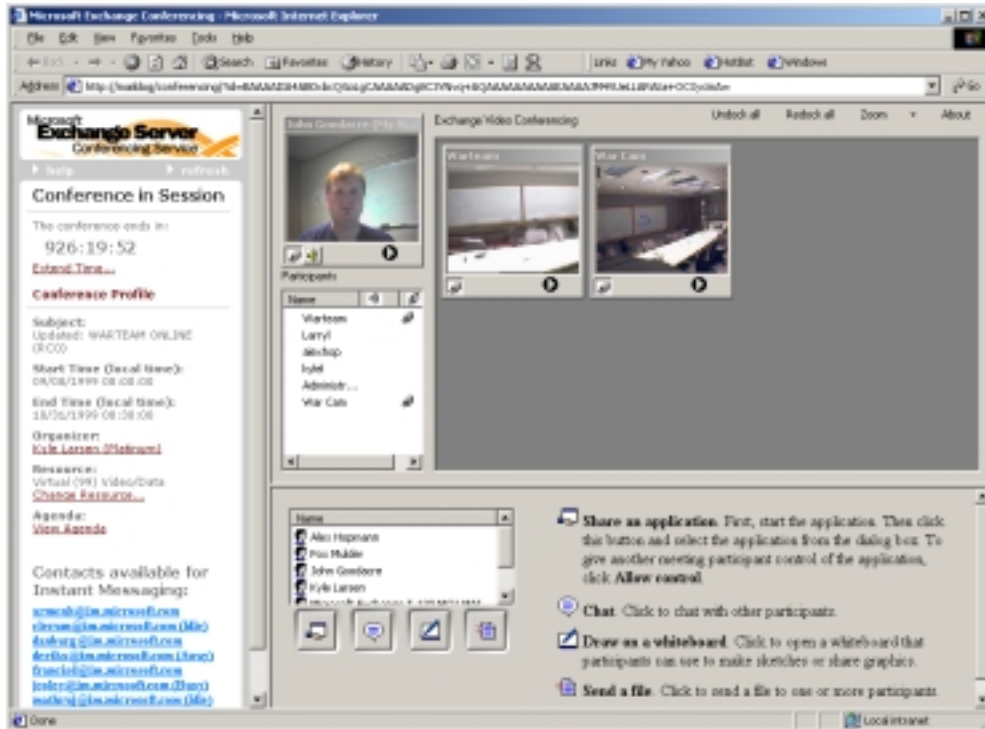
We can overcome these limitations by using Exchange 2000 server.

3.1 We can use Exchange 2000 Server Conferencing to achieve multi-cast real-time conferencing.

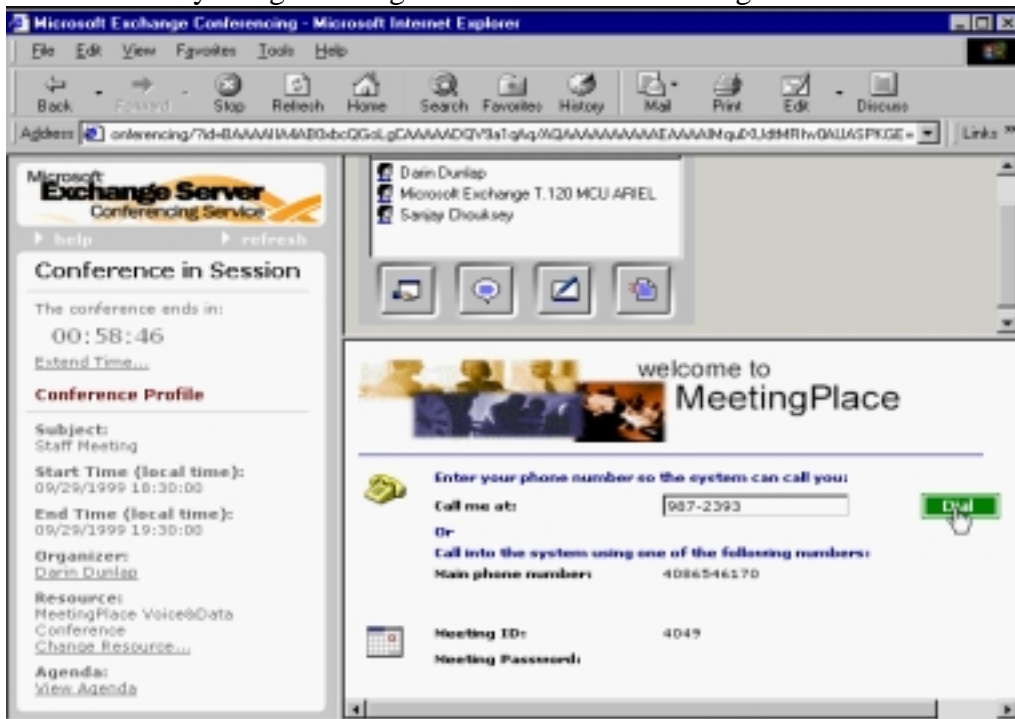
We can use Exchange 2000 conference server to share real-time video with all the conference participants.

3.1.1 Exchange 2000 server can support IP-based multicast technology that is modeled on the TAPI 3.0 standard to provide audio and video teleconferencing services, which allows significantly more simultaneous participants in a video conference than an H323-based solution.

- 3.1.2 We can allow users to participate in Video conferencing using any browsing that support ActiveX control rather than Netmeeting. Video conferencing is web-based now.

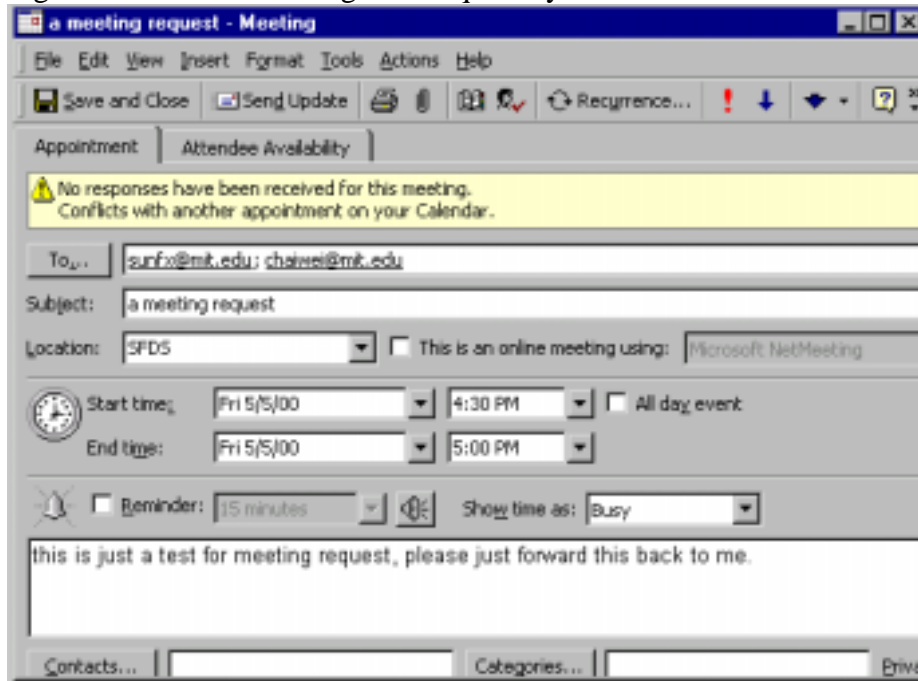


- 3.1.3 Other features, such as chat, whiteboard and application sharing, are also available by using Exchange 2000 server conferencing.

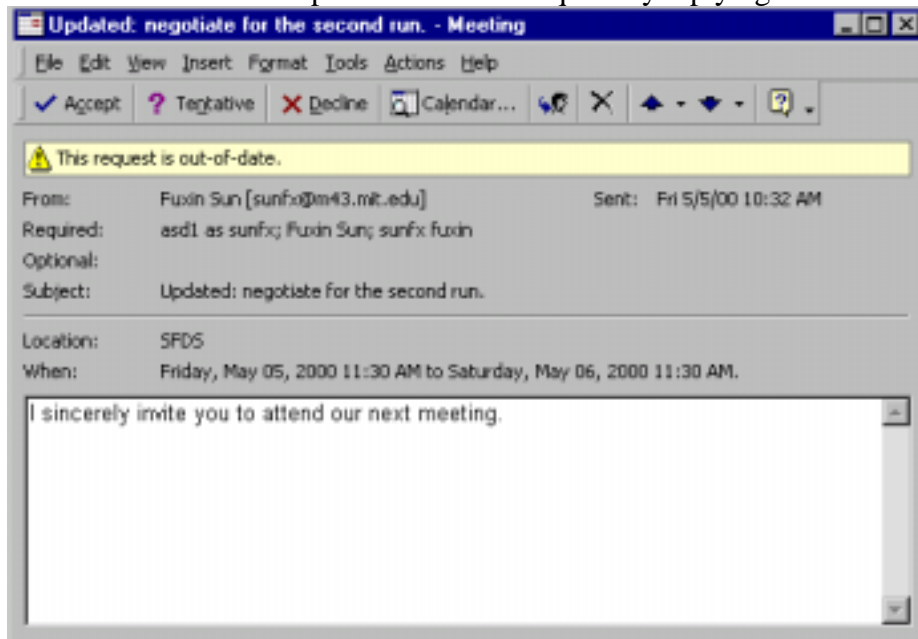


3.2 We can automate meeting schedule negotiation by Exchange 2000 Server and Outlook 2000.

3.2.1 We can use Outlook2000 to schedule a meeting. Outlook 2000 supports iCalendar, vCalendar, etc., which allow scheduling meeting via email. Meeting organizer can send meeting time request by email.

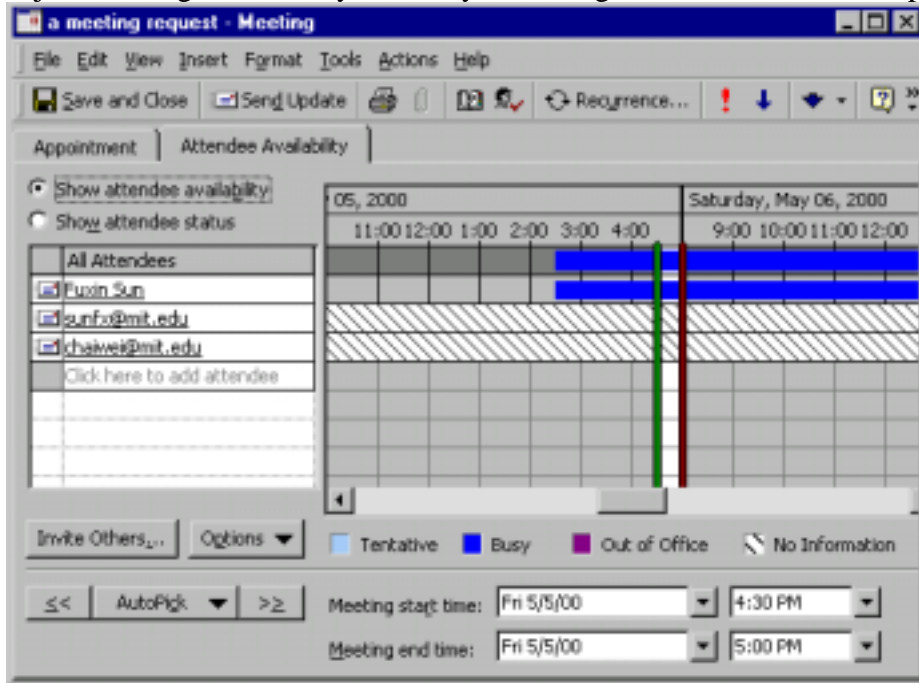


3.2.2 Attendee can accept or decline the request by replying that email.

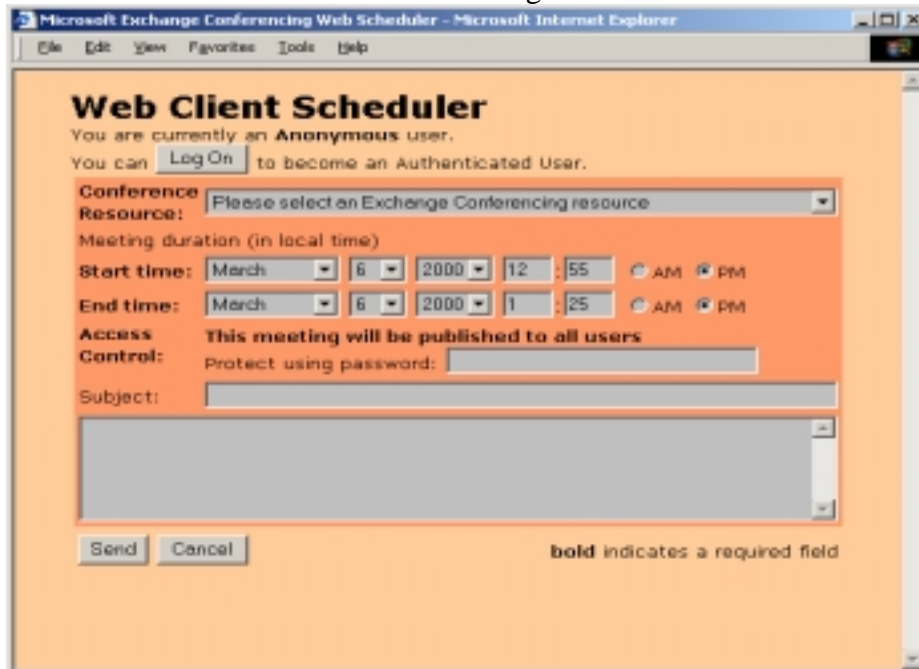


3.2.3 The calendar information of all the invited attendees can be automatically extracted from the message replied. The free/busy time information can be

displayed in the meeting organizer's outlook window. The meeting organizer can adjust meeting schedule dynamically according to all the attendee's response.



3.2.4 We can use the Web Client Scheduler to schedule an online meeting. This scheduler extends Outlook 2000's scheduling function onto Internet, which enables calendar information and meeting schedule accessed online.



- 3.2.5 By integrating outlook 2000 and Exchange 2000 server together, we can allow users to share their calendar information directly avoid of the latency of email.

3.3 Providing Instant Messaging by integrating Exchange 2000 and Active Directory.

- 3.3.1 By integrating Active Directory with Exchange 2000 server, we can maintain a uniformed user information database, which allows users to find each other easily.
- 3.3.2 User can send instant message to an account in Active Directory and the receiver can get the message displayed on his terminal instantly.
- 3.3.3 Firewall technology. Exchange 2000 instant messaging allows secure messaging through a variety of firewall configurations commonly found in corporations, including HTTP reverse proxies, packet filters, DMZ-type configurations, etc. This allows more secure messaging across and within organizations.
- 3.3.4 Security issue: Exchange 2000 is integrated with Window 2000 server closely, and we can use Windows 2000 ACLs to control the access to conferencing resources.