

ST App Note 16021 (AN 16021)

August, 2016

ShoreTel Connect Integration with Microsoft

Description: This application note describes the integration between ShoreTel Connect (ONSITE and CLOUD) and Microsoft's Outlook, Exchange, Office 365, and Skype for Business products.

Environment:

ShoreTel Connect ONSITE or ShoreTel Connect CLOUD
ShoreTel Connect desktop application (for Windows and Mac)
Microsoft Exchange, Office 365, Outlook, Skype for Business

Target Audience:

ShoreTel Partners
ShoreTel Partner Sales Engineers
ShoreTel Solution Architects
ShoreTel Connect and I.T. system administrators

The ShoreTel Connect desktop application includes several unified communications functions, which allow access to the user's contacts, meetings, voicemail, and other users' availability status. This information is obtained through integration between the Connect application, the user's Outlook account, Exchange server or Office 365, and the ShoreTel Connect system. There are several mechanisms which provide this integration, including plug-ins, APIs, and domain services.

This document explains the Connect components which communicate with Microsoft Outlook, Exchange, Office 365, and Skype for Business, and what processes are involved.

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Introduction

One of the primary advantages of the ShoreTel Connect desktop application, the Connect client, is to allow the user one place to view and manage unified communication features such as the user's contacts, voicemail, meetings and conferences, and to view the availability status of other users. This is accomplished with integration between the Connect application and the user's Outlook account, Exchange or Office 365, and the ShoreTel Connect system.

The integration is enabled in several applications. Some of the integration is within the Exchange or Office 365 environment. Some integration is enabled within the configuration of the ShoreTel Connect system itself. There are also several Outlook plug-in (add-in) modules which communicate from Outlook to Exchange / Office 365, the Connect application, and the Connect system.

These components work together to provide the functions and features that are available to the user from the Connect desktop application.

Terms

The following terms are used within this document.

ShoreTel Connect: Generally referring to the entire ShoreTel Connect environment, including the Connect ONSITE system, Connect CLOUD system, and the ShoreTel Connect desktop application.

Connect desktop application, Connect client, Connect app: The ShoreTel application, which is installed on the user's desktop computer system and is used to interact with the Connect system.

UCB (Unified Conference Bridge): The ShoreTel Collaboration Service Appliance (SA-100, SA-400 and the Virtual SA) that runs the ShoreTel Collaboration software, including instant messaging, audio conferencing, and desktop sharing for Windows and Mac. Note that both ShoreTel ONSITE and ShoreTel CLOUD systems use UCB technology. The ShoreTel CLOUD system uses Virtual SA technology, but the features and functionality are essentially the same as ONSITE.

EWS: Microsoft's Exchange Web Services API, which is used to access data from Microsoft Exchange or Office 365.

Plug-in (Add-in): An installed module to Outlook (or another application), which provides additional functionality and interoperability with other external modules.

ICS file (.ics): A file format, which allows users to share calendar event information with other users and be used by various calendar applications.

Exchange / Office 365 Integration with Exchange Web Services

The Connect application shows the user's contacts, upcoming calendar meetings, and past meetings. This information comes from the user's Exchange or Office 365 account. In order to get that information, Connect must communicate with Exchange / Office 365.

Connect integration with the Exchange and Office 365 environment is accomplished using Exchange Web Services (EWS). EWS is an Application Programming Interface (API) that provides an application, such as Connect, with access to data from the Exchange and Office 365. EWS retrieves data from the user's Exchange or Office 365 account, and sends that data to the Connect application. Connect uses the data to display and manage those Exchange / Office 365 items.

ShoreTel Connect integrates with Office 365 in the same way as a local Exchange server. All integration between the Connect desktop application and Exchange / Outlook is the same when using Office 365. The notation "Exchange / Office 365" is used below to denote both the Exchange server system and Office 365.

Through EWS, Connect can access and manage the user's contacts, meetings and calendar events, and retrieve user pictures (avatars) to display in the Connect application. Any data that the Connect application needs from Exchange / Office 365 is accessed via EWS.

For example, in order to generate the list of the user's upcoming events, the Connect application uses EWS to contact Exchange / Office 365 and retrieve the user's calendar meetings. The full Corporate Directory is also retrieved via EWS and displayed on the People pane of the Connect application.

Similarly, to retrieve the user pictures, which are displayed on a user's Contact Card, the Connect application uses EWS to contact Exchange / Office 365 which in turn retrieves the picture from Active Directory. The Connect application does not contact Active Directory directly, but uses EWS to get the information. Additionally, by using EWS rather than a direct connection to Active Directory, the Connect application does not need a VPN connection when connected outside the local enterprise network. (Also see App Note 15041 for more information on importing user pictures into Active Directory / Exchange.)

Exchange / Office 365 integration is enabled and configured in ShoreTel Director (Administration > System > Additional Parameters > Service Appliance (Collaboration)).

- The "Enable Exchange connector" box is checked.
- The location of the Exchange server (IP or FQDN) is entered in the "Exchange server" field. Director sends this server data to the Connect client.
For Office 365, enter "outlook.office365.com".

- Text data must be entered in the “Username” and “Password” fields. **Note that this information is not currently used** by Director or the Connect application. The data can be any value. (These fields may be removed or repurposed in a future release.)

The screenshot shows the 'Service Appliance (Collaboration)' configuration page. It features a checked checkbox for 'Enable Exchange connector'. Below this, the 'Exchange server' section contains fields for 'Exchange server' (with the value 'exchange01.anycompany.com'), 'Username' (with the value 'administrator'), and 'Password' (masked with dots). A note '(4 - 26 characters)' is positioned to the right of the password field. The 'Log file storage' section includes 'Max days' (set to 7, with a range of 1-30) and 'Max size' (set to 4000 MB, with a range of 10-60000). The 'Conferencing' section has a 'Global conferencing URL' field.

Figure 1 - ShoreTel Director, Additional Parameters

Outlook for Windows Integration

The Connect application integrates with Outlook for Windows through the use of several plug-in (add-on) components. These plug-in modules are installed into Outlook when the Connect application is installed on the user’s desktop system.

ShoreTelConnectCASConnHostAddIn

This is the “Host” plug-in. This module has the actual connection to the ShoreTel Connect system (ONSITE and CLOUD) and is the only module that maintains this connection. The connection is made through the CAS (Client Application Service). It is bidirectional (can send and receive data to and from Exchange / Office 365 and Outlook). The other ShoreTel Outlook plug-in modules communicate with this plug-in when they need data from ShoreTel Connect or have data to update in the Connect system (rather than each plug-in maintaining a separate connection).

ShoreTelConnectContactUploadAddIn

This is the “Contact” plug-in. This module sends local contacts, also called personal contacts, from Outlook to the ShoreTel HQ server for use by the Connect desktop application. These local

contacts are also displayed on the user's desk phone and the Mobility client. Users will be able to search on any of these devices for a local contact and place a call.

Corporate Directory searches from the Connect application are performed directly; this plug-in is not needed for that function. See the [Exchange / Office 365 Integration with Exchange Web Services](#) section above. This plug-in is only needed to sync local contacts from Outlook to Connect.

ShoreTelConnectUCBAddIn

This is the "UCB" (or "meeting") plug-in. This module performs several functions when creating an Outlook meeting invitation. Both ONSITE and CLOUD use this Outlook plug-in.

The "Meeting" plug-in:

- Inserts the Connect meeting URL into the body of the meeting invitation. For ONSITE, the URL is obtained from the ShoreTel UCB appliance. For CLOUD, the URL is obtained from the CLOUD service.
- Sends information about meeting's host, presenters, and attendees to the UCB or CLOUD service. This information, along with all the other meeting parameters (such as the meeting name, date, time, dial-in info, etc.), are stored on the UCB or CLOUD service for that event.
- Inserts the user's "Availability State" into the meeting. This state is selected in the Outlook meeting invitation from the "Availability State" drop-down of the ShoreTel tab (in the meeting invitation "ribbon"). The selected user state will take effect when the user's meeting time occurs, and sets the desired routing rules for that state. (These rules can be configured in the Call Routing preferences of the Connect user application.)

There are two methods to create a Connect meeting. One method is from Outlook itself, by manually creating a new Outlook meeting, and clicking the ShoreTel Conference button or drop-down in the ShoreTel tab of the Outlook meeting ribbon. When the ShoreTel Conference is clicked, a new Connect conference is created and the conference information is copied into the body of the Outlook invitation, including the conference URL, dial-in information, participant access code and password, and any other information.

The second method is to create a Connect meeting with the Connect desktop application. The user clicks the "New Event" button and fills out the Connect meeting invitation form. When the "Create Event Invite" button is clicked, an Outlook meeting invitation is launched via an API. The Outlook meeting invitation is populated with the Connect meeting information.

The “Meeting” plug-in provides the meeting data, such as the dial-in number, access code, conference URL, etc. for the Outlook meeting invite. This data will be used by the UCB or CLOUD service when the meeting is active. When the meeting invitation is sent, the meeting data is saved in the user’s Outlook calendar, stored on Exchange / Office 365, and also saved on the UCB or CLOUD service.

The Connect application shows the user’s meeting events (on the Events pane) and the user can join the meetings from the Connect application.

ShorTelConnectSTVMAddIn

This is the “Voicemail” plug-in. This module receives voicemail data from the ShoreTel HQ server and can optionally send voicemail messages to the user’s Outlook inbox. Voicemail messages are normally displayed, played, and managed on the Recent pane in the Connect application. The user can also have voicemail messages delivered to Outlook by selecting options within the Connect application. There are two types of these voicemail messages within Outlook.

One type of email message contains a built-in voicemail player. The message can be played via the user’s deskphone or computer speakers, forwarded, deleted, or a voice call can be initiated to the caller. The email messages containing voicemail are indicated by a cassette icon, and include the caller’s Caller ID and phone number in the message header. The Outlook plug-ins must have a connection to the ShoreTel system, either by internal network or VPN, in order to play the voicemail. If this voicemail email is deleted, the voicemail message itself is also removed from the Connect application and the user’s deskphone.

To enable the message with the built-in player, access the Settings menu within the Connect desktop application and select Voicemail > Outlook > “Show my voicemail inline with my Outlook inbox”.

The other type of email is a voicemail notification which optionally contains a wave file attachment of the voicemail message. The email includes the caller’s Caller ID and phone number in the message header, and the length of the voicemail message.

Playing or deleting this type of voicemail notification only deletes the email message and does not sync the action with Connect. It does not mark the voicemail message as played or delete the voicemail from the ShoreTel system.

To enable the notification email with the optional wave file, access the Settings menu within the Connect desktop application and select Notifications > Voicemail > “Send email notification about incoming voicemail to”, and enter the user’s email address. To include the wave file attachment, also check the “Attach voicemail as a wave file”. The ShoreTel administrator can also enable this type of email from Director by selecting Administration > Users > Users > {username} > Voice Mail, and entering the user’s email address and selecting the desired Delivery Type from the dropdown menu.

“PresenceBubbleApp” process and Availability State

The PresenceBubbleApp is a separate background process that is registered with Outlook for Windows. This process is used to retrieve the ShoreTel “Availability State” of users and display that state in Outlook. It uses CAS (Client Application Service) to connect to the ShoreTel HQ server.

When a user’s name is displayed or typed in a sender or recipient field of an email message (e.g. the “To:” field), meeting invitation, contact card, or any place a user’s name is displayed, a small colored square is displayed to the left of user’s name. This colored square is the Outlook “Presence” icon and indicates the user’s current ShoreTel Availability State. The Connect client must be running in order to display the Availability State in Outlook.

The user’s Availability State is displayed in the Connect application by the large colored box to the left of the user’s name. The color and meaning of the Outlook presence icon always matches the Availability State in the Connect application. For example, the Outlook presence icon will be green for a user whose Connect Availability State is “Available”. The Outlook presence icon will be yellow if the user’s Availability State is “In a Meeting”.

The PresenceBubbleApp process polls the ShoreTel Connect system for Availability State (previously called “Call Handling Status or “Call Handling Mode”) and the “on-phone” status for each user displayed. Availability State is displayed in real-time via the availability icons.

Note that Instant Message state does not affect the Availability State. IM state is displayed as a “speech bubble” icon on a Connect Contact Card and is either “offline” or “online”.

The Availability State can be set manually in the Connect application by clicking the Availability State and selecting a desired state from the dropdown menu. The Availability State can also be set automatically according to the Call Routing rules within Connect (Settings > Call Routing > Availability Routing or Power Routing).

The PresenceBubbleApp appears in the Windows Task Manager as a separate process. It remains in the background as long as the Connect desktop application is running (even if minimized).

The PresenceBubbleApp also provides the ability to initiate a voice call or send an Instant Message to a user from the Outlook pop-up contact card box. This can be selected by clicking or hovering on a displayed user and selecting the desired function from the contact card options. For IM, the PresenceBubbleApp will start the Connect IM session.

Only one process of this type can be registered with Outlook at a time (for example, ShoreTel Connect or Microsoft Skype for Business). The first application that launches the PresenceBubbleApp process will own the functionality until that application is closed.

The PresenceBubbleApp process is for Windows only. This process does not run on Apple Mac and subsequently Outlook for Mac does not display the Availability State icon next to user names.

Flow Diagram for Windows

The diagram below shows the general data flow between the ShoreTel Connect and Windows components.

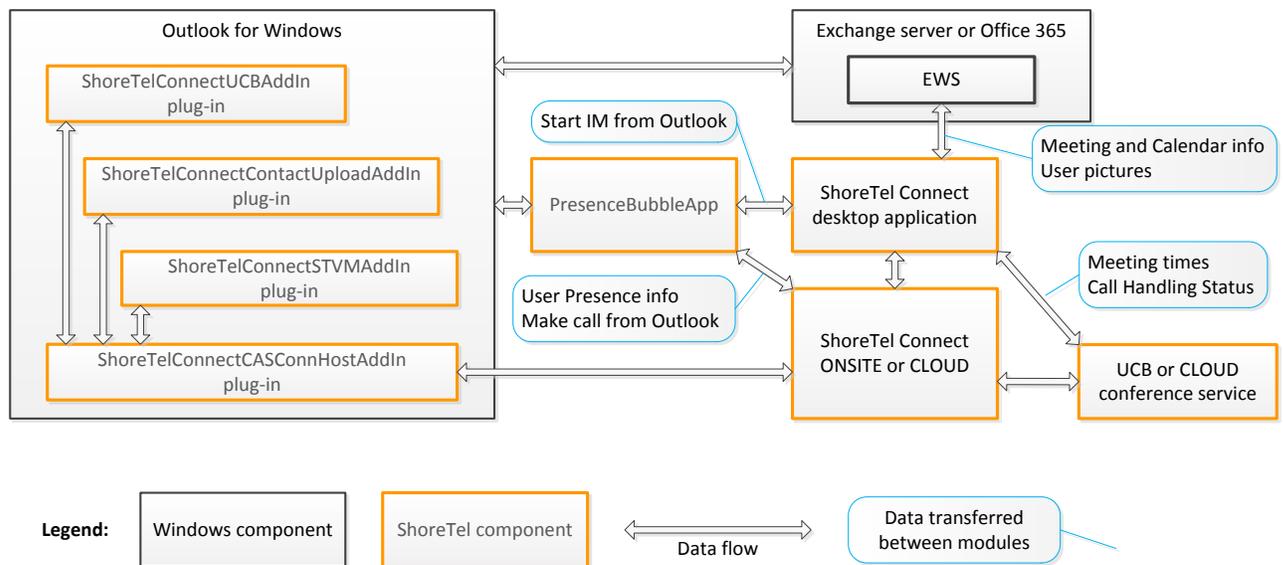


Figure 2 - Flow diagram for Windows

Outlook for Mac Integration

Outlook for Mac does not use any plug-in modules. There is no direct integration when using Outlook for Mac with ShoreTel Connect contacts, meeting management, or voicemail. Because of this, some functionality is simplified, and some functions are reduced or not available.

Local Mac contacts are stored in the Apple Contacts application (not in Outlook). Apple Contacts directly interfaces with Exchange or Office 365.

ShoreTel Connect integrates with Office 365 in the same way as a local Exchange server. All integration between the Connect desktop application and Exchange / Outlook is the same when using Office 365.

Since Outlook for Mac does not support plug-ins, local contacts are sent from the Apple Contacts application to the ShoreTel Connect system (ONSITE and CLOUD) via the ShoreTel “UpLoadCMD” process. UpLoadCMD runs outside of Outlook and sends changes in the Contacts application to Connect. Connect can then access local contact data without having an Outlook plug-in.

When using Outlook for Mac, users must create Connect meeting invitations with the Connect application. The user clicks the “New Event” icon and fills out the Connect meeting invitation form. When the “Create Event Invite” button is clicked, Apple Script is utilized to launch an Outlook meeting invitation. The Outlook meeting invitation is populated with the Connect and meeting information (such as the meeting URL, meeting time, participants, Call Handling Status, etc.).

When the meeting invitation is sent, the meeting data is saved in the user’s Outlook calendar (stored on Exchange or Office 365) and also saved on the UCB or CLOUD service. The Connect “Events” pane shows the user’s meeting events and the user can join the meetings from the Connect application.

Flow Diagram for Mac

The diagram below shows the general data flow between the ShoreTel Connect and Apple Mac components.

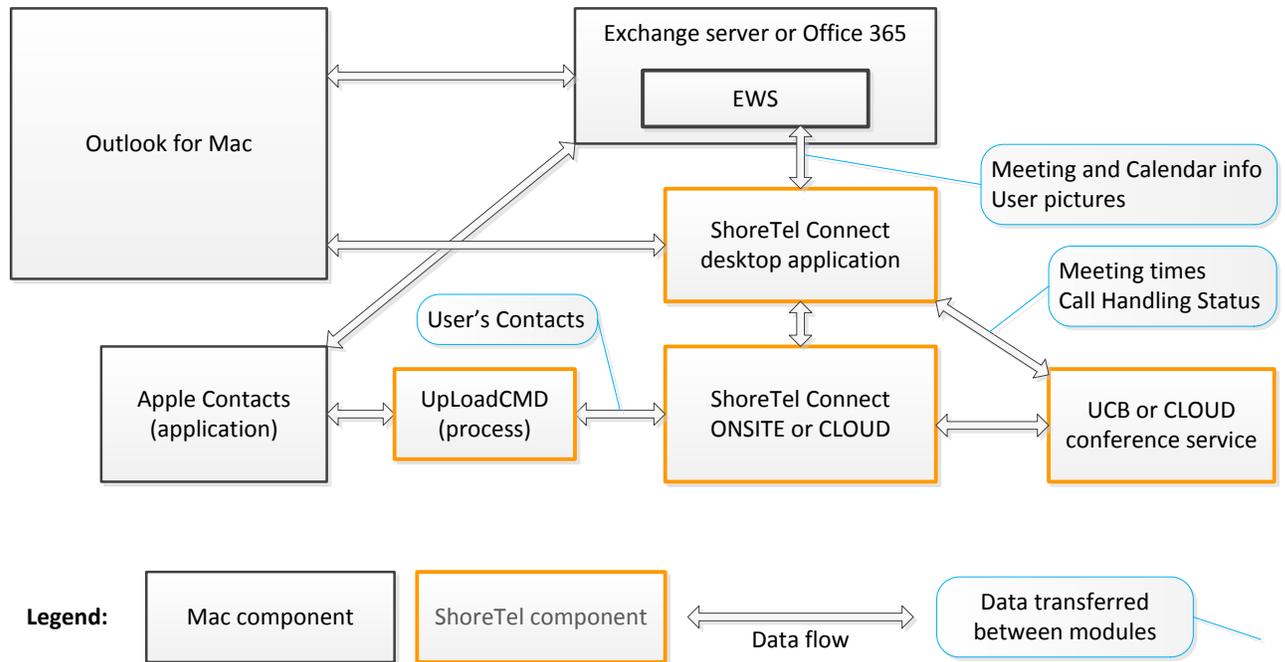


Figure 3 - Flow Diagram for Mac

Meeting Synchronization between Connect, Exchange / Office 365, and Outlook

The Connect desktop application displays all upcoming and past meeting events for a user on the Connect “Events” pane. The meeting list is synchronized between Exchange / Office 365, Outlook, the ONSITE UCB or CLOUD service, and Connect.

Meeting and conference data is stored on the user’s Exchange / Office 365 calendar and the UCB / CLOUD service. Because the data is stored in two places, it must be synchronized to maintain data integrity.

ShoreTel Connect integrates with Office 365 in the same way as a local Exchange server. All integration between the Connect desktop application, Exchange, and Outlook is the same when using Office 365.

Synchronization with Exchange / Office 365 and Outlook

The most common scenario is when the user has an Exchange or Office 365 account, and uses Outlook. Meetings can be created with the Connect desktop application or directly from Outlook. If the meeting event is created using the Connect application, an Outlook meeting invitation is launched (“popped”) from Connect. The user then fills out any additional information on the Outlook meeting invitation and sends the invitation.

Note that the user must send the Outlook meeting invitation in order for the Connect workflow to complete successfully. If the user does not send the invitation, the Connect event is not created.

The meeting event is delivered via Outlook to Exchange / Office 365. The event is stored in the calendar for the user, and also stored on the UCB or CLOUD service.

Connect events and meetings are displayed on the Connect Events pane. The list of meetings comes from Exchange / Office 365.

When a meeting event is updated or deleted in the Connect application, an Outlook meeting update is also launched. The user must send this update invitation in order for the Connect meeting to update successfully.

If a meeting event is updated or deleted, either in the Connect application or in Outlook, the Connect application synchronizes the meeting data between the user’s calendar and the UCB / CLOUD service. The Connect client maintains an active (live) connection to Exchange / Office 365. Meeting data is compared and the most current data is stored in Exchange / Office 365 and the UCB / CLOUD service. This synchronization happens immediately.

Synchronization with Exchange / Office 365 only (no Outlook)

In the case where the user has an Exchange or Office 365 account, but is not using Outlook, meetings can still be created with the Connect application. Those meetings are stored on the UCB or CLOUD service.

The user can also download an ICS file for any Connect event, which can be sent to external users, uploaded to the user's calendar (via a web browser), or used by the user with another calendaring application. Uploading the ICS file is the only typical way that Exchange / Office 365 will have the meeting data in this case. Otherwise, the list of meeting events comes from the UCB or CLOUD service.

The ICS download link appears on the expanded information pane of the Connect meeting. The ICS file data comes from the UCB or CLOUD service, and is generated at the time of the user's request.

Note that this scenario is not typical.

Synchronization with Outlook only (no Exchange / Office 365)

In the case where the user has Outlook, but does not have an Exchange or Office 365 account, meetings must be created with both the Connect desktop application and directly from Outlook. This is because without Exchange or Office 365, Connect cannot synchronize meeting events between the user's Outlook calendar and the UCB or CLOUD service. In this case, when a Connect event is created, an Outlook meeting invitation is not automatically launched because that functionality requires Exchange or Office 365 to be configured in Director.

The Connect meeting list (displayed on the Events pane) comes from the UCB or CLOUD service. Events that are on the user's Outlook calendar, but were not created with the Connect application, will not appear in the Connect meeting list.

Synchronization without Exchange / Office 365 and without Outlook

In the case where the user has neither an Exchange nor an Office 365 account, and is not using Outlook, meetings are created with the Connect application and are stored in the UCB or CLOUD service. The Connect meeting list comes from the UCB or CLOUD service.

The user can download an ICS file for any Connect event, which can be sent to external users or used by the user with another calendaring application. The ICS download link appears on the

expanded information pane of the Connect meeting. The ICS file data comes from the UCB or CLOUD service, and is generated at the time of the user's request.

Connect Integration with the Corporate Directory (GAL) and Public Folders

ShoreTel Connect stores Enterprise Contacts and Corporate Directory information in two places. Users and their extension numbers are stored in the ShoreTel system (for both ONSITE and CLOUD). Other phone numbers and contact information are stored in the Global Address List (GAL) which can be provided by Exchange or LDAP.

When a user performs a search from the Connect client, the client executes two search requests. One search request goes to the ShoreTel system via the CAS (Client Application Service) and the other search request goes to the GAL via EWS. The Connect client then combines the data by matching the email address from the CAS and the GAL for each contact.

The combined data for the user's search request is displayed in the Connect client in a single view. Up to 25 contacts are displayed in the search result.

Contacts within an Exchange Public Folder are also included in the GAL search request from the Connect client. There is no distinction between contacts which come from the GAL or from Public Folders. The Connect client does not know if the search results came from the Exchange, LDAP, or Public Folders. All matching contacts will be returned and displayed in the search results.

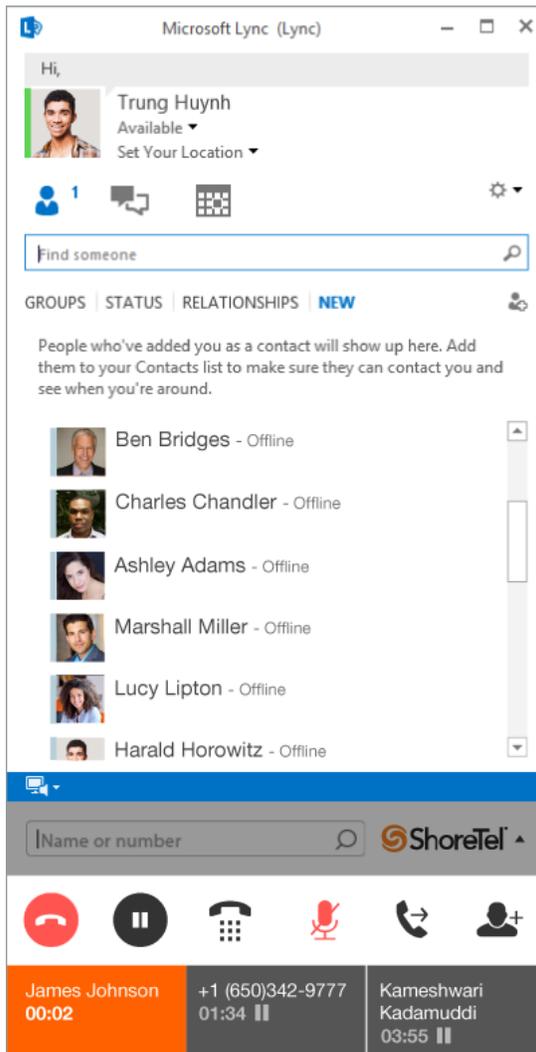
Connect Integration with Office 365

ShoreTel Connect integrates with Office 365 in the same way as a local Exchange server. All integration between the Connect desktop application and Exchange / Outlook is the same when using Office 365.

To enable integration with Office 365, simply set the Exchange server address parameter in ShoreTel Director (Administration > System > Additional Parameters > Service Appliance (Collaboration)) to "outlook.office365.com". The ShoreTel Connect system manages all other integration with Office 365.

Connect Integration with Microsoft Skype for Business

The ShoreTel Connect system can integrate with Microsoft Skype for Business and provide telephony features, such as calling, transfers, conferencing, call history, voicemail, and control of the user's deskphone and softphone. These functions are accessed via the "Connect Telephony for Microsoft plug-in". This is a separately installed application which integrates into the Skype for Business desktop application. A miniature ShoreTel Connect window "docks" to the bottom of the Skype for Business window and allows the user access to the Connect functions.



Skype for Business application window

ShoreTel Connect plug-in

Figure 4 - Skype for Business application, with the ShoreTel Connect Telephony for Microsoft plug-in

Once the Connect Telephony for Microsoft plug-in is installed, it is registered as a separate process. This process provides access to the ShoreTel HQ server and the ShoreTel telephony user functions.

The Connect Telephony for Microsoft plug-in cannot be installed with the Connect desktop application. Only one application of this type can be installed (the Connect desktop application or the Connect Telephony for Microsoft plug-in, not both).

For more information on the Connect Telephony for Microsoft plug-in, see the Connect Telephony for Microsoft User Guide and the Connect Telephony for Microsoft plug-in App Note.

Conclusion

ShoreTel Connect integrates with Outlook, Exchange, Office 365, and Skype for Business, and provides robust interoperability with functionality which is easy to use and transparent to the user. Data synchronization between ShoreTel systems (ONSITE and CLOUD) and Microsoft ensures reliability in a number of flexible scenarios.

Additional Resources

- ShoreTel Connect System Administration Guide
- ShoreTel Connect ONSITE Planning and Installation Guide
- ShoreTel Conferencing and Instant Messaging Planning and Installation Guide

Version	Date	Contributor	Content
1.0	August, 2016	W. Toigo	Original App Note