Avaya Microsoft Lync Integration and Microsoft Office Communicator Add-in Fundamentals for Avaya CS 1000 and Cisco Unified Communication Manager

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Chapter 1: New in this release

The following sections describe what's new in *Avaya Microsoft Lync Integration and Microsoft Office Communicator Add-in Fundamentals for Avaya CS 1000 and Cisco Unified Communication Manager* (02–604118) for release 6.2.2.

CS 2100 and Cisco UCM discontinued

Lync Integration no longer supports CS 2100 and Cisco UCM. The title of this document will be updated in the next major release (Release 6.3).

Support for CS 1000 Collaboration Pack

Lync Integration now includes a CS 1000 Collaboration Pack offer. The Collaboration Pack supports Computer mode and includes video capabilities. For more information about the CS 1000 Collaboration Pack, see *Avaya Microsoft Lync Integration and Microsoft Office Communicator Add-in Fundamentals for Avaya Aura®* (NN10850–014).

Support for Avaya Agile Communication Environment™ 6.2.1

Lync Integration for CS 1000 works an Avaya ACE™ 6.2.1 server. The functionality of the 3.0 AIE server has been merged with the Avaya ACE Core 6.2.1 server, so there are no separate AIE requirements with an Avaya ACE 6.2.1 enterprise deployment.

Chapter 2: Introduction

Avaya Microsoft Lync Integration and Microsoft Office Communicator Add-in Fundamentals for Avaya CS 1000 and Cisco Unified Communication Manager (02–604118) provides the information needed to administer Avaya CS 1000 deployments on:

- Avaya Microsoft Lync Integration
- Avaya Microsoft Communicator Add-in

The Avaya Lync Integration is intended for a network environment where Microsoft Lync Server 2010 is deployed. Avaya Lync Integration is a client side add-in to Microsoft Lync 2010. The Avaya Communicator Add-in is intended for a network environment where Microsoft OCS is deployed. Avaya Communicator Add-in is a client side add-in to Microsoft Communicator.

Important:

Avaya Lync Integration is only supported on the Microsoft Lync 2010 client. Other versions of the Lync client do not support Lync Integration.

The Communicator Add-in is only supported on the Microsoft Office Communicator 2007 R2 client.

Terminology

In this document, the term Avaya Lync Integration will be used to refer to both Avaya Lync Integration and Avaya Communicator Add-in unless specific Avaya Communicator Add-in features are being highlighted.

Avaya product names:

The following product names are used for Avaya Lync Integration.

- Avaya Lync Integration
- Lync Integration

The following product names are used for Avaya Communicator Add-in.

- Avaya Communicator Add-in
- Communicator Add-in

Microsoft product names:

The following product names are used for the Microsoft Lync solution.

- Microsoft Lync Server 2010
- Lync Server 2010
- Microsoft Lync 2010 (client)
- Lync 2010 (client)

The following product names are used for the Microsoft Office Communicator (MOC) solution.

- Microsoft Office Communication Server 2007 R2
- Office Communication Server 2007 R2
- Microsoft Office Communicator 2007 R2 (client)
- Office Communicator 2007 R2 (client)
- Communicator (client)

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Avaya Mentor videos

Avaya Mentor is an Avaya-run channel on YouTube that includes technical content on how to install, configure, and troubleshoot Avaya products.

Go to http://www.youtube.com/AvayaMentor and perform one of the following actions:

- Enter a key word or key words in the Search Channel to search for a specific product or topic.
- Scroll down Playlists, and click the name of a topic to see the available list of videos posted on the site.

Chapter 3: Avaya Microsoft Lync Integration overview

Network administrators can integrate the Avaya Agile Communication Environment™ (ACE) into their Microsoft Lync or Microsoft Office Communications Server (OCS) 2007 R2 network infrastructure to enhance existing communication services. Avaya ACE™ supports unified communication (UC) desktop integration with Microsoft Lync 2010 clients and Microsoft Office Communicator 2007 R2 clients. Leveraging Avaya ACE web services and user profile management, administrators of Microsoft networks can provide unified communication services to clients utilizing their Avaya Communication Server 1000 service provider.

Avaya Lync and OCS integration is client side. The Avaya Lync Integration is an add-in application that extends Microsoft Lync or Microsoft Office Communicator client functionality using Microsoft supported APIs. The Avaya Lync Integration extends Microsoft Lync Client providing two telephony modes, Phone and Computer mode. Phone mode allows the user to control the desktop phone, with media going over existing PBX telephony equipment. Computer mode allows the user to use the computer as a phone, using the media capabilities of the computer. For a description of the services available in Phone and Computer mode, see Telephony services with Lync Integration on page 23.

The Avaya Lync Integration interacts with the Lync 2010 client directly using Microsoft Supported APIs. All telephony capabilities are integrated directly between Avaya Lync Integration, Avaya ACE 6.2.1, and the Microsoft Lync 2010 client. The Avaya solutions telephony capabilities with Lync 2010 requires only an OCS 2007 R2 Standard CAL (license), eliminating the need for a Microsoft voice infrastructure and the Microsoft OCS Enterprise CAL. Remote Call Control and Enterprise Voice must be disabled on the Lync or OCS server.

Important:

For more information about the CS 1000 Collaboration Pack, see *Avaya Microsoft Lync Integration and Microsoft Office Communicator Add-in Fundamentals for Avaya Aura®* (NN10850–014).

Language support

Avaya Lync Integration supports the following languages:

- English
- French, International
- German

- Italian
- Japanese
- Korean
- Portuguese, Brazilian
- Russian
- Spanish, International
- Chinese, Simplified

Lync Integration features

The Lync Integration solution uses the Lync 2010 Microsoft Office Communicator user interface to provide voice services.

Note:

For a detailed description of each voice service and a list of the services supported by each service provider, see Telephony services with Lync Integration on page 23.

The solution supports the following functionality:

- Support for Computer (soft client) and Phone (CTI control of desk phone) modes.
- Make Calls from Contact list, or search dialog box utilizing contacts published numbers.
- Redirect incoming calls to your mobile, home, other number, or voicemail.
- In conjunction with the Office Add-in and Web Browser Add-in applications, you can make calls from Microsoft Office applications and Internet Explorer (see *Avaya Configurator for Desktop Communication Enablement Fundamentals* (NN10850-031).
- Translation of E.164 numbers to customer dial plan including insertion or deletion of appropriate digits.
- Publish Telephony Presences on behalf of the user when their client is signed in and on a call.
- Display a conversation window with the following mid-call functionality:
    - Release/End call.
    - Place call on Hold and Retrieve call.
    - Insert DTMF digit in to an established call.
    - Speaker volume control and speaker mute function (Computer mode).
    - Microphone mute function (Computer mode).

- Display an incoming call window with the following functionality:
  - Indicate the Incoming Caller line ID or Caller name.
  - Allow the user to Answer the call or Deflect (Phone mode with Restful Session Control) to one of their specified devices.
  - While On a call, indicate that another call is waiting. Answering this call places the first call on Hold.
  - Graphically indicate which device (Computer or Phone mode) the call will be answered on.
- Set Call Forward options.

Lync Integration network

Microsoft Lync 2010 may be deployed within an Enterprise, on premise, or within a Hosted Office 365 deployment. Microsoft Office Communication System 2007 R2 may be deployed within an Enterprise or as a hosted service. Avaya Microsoft Lync Integration will inter-operate with Lync 2010 or Communicator 2007 R2 clients deployed on the user's PC. The following diagram represents Avaya Lync Integration deployed within an Enterprise. For more information about Lync Integration deployed in a hosted service configuration, see Lync Integration support for Microsoft Office 365 on page 17.

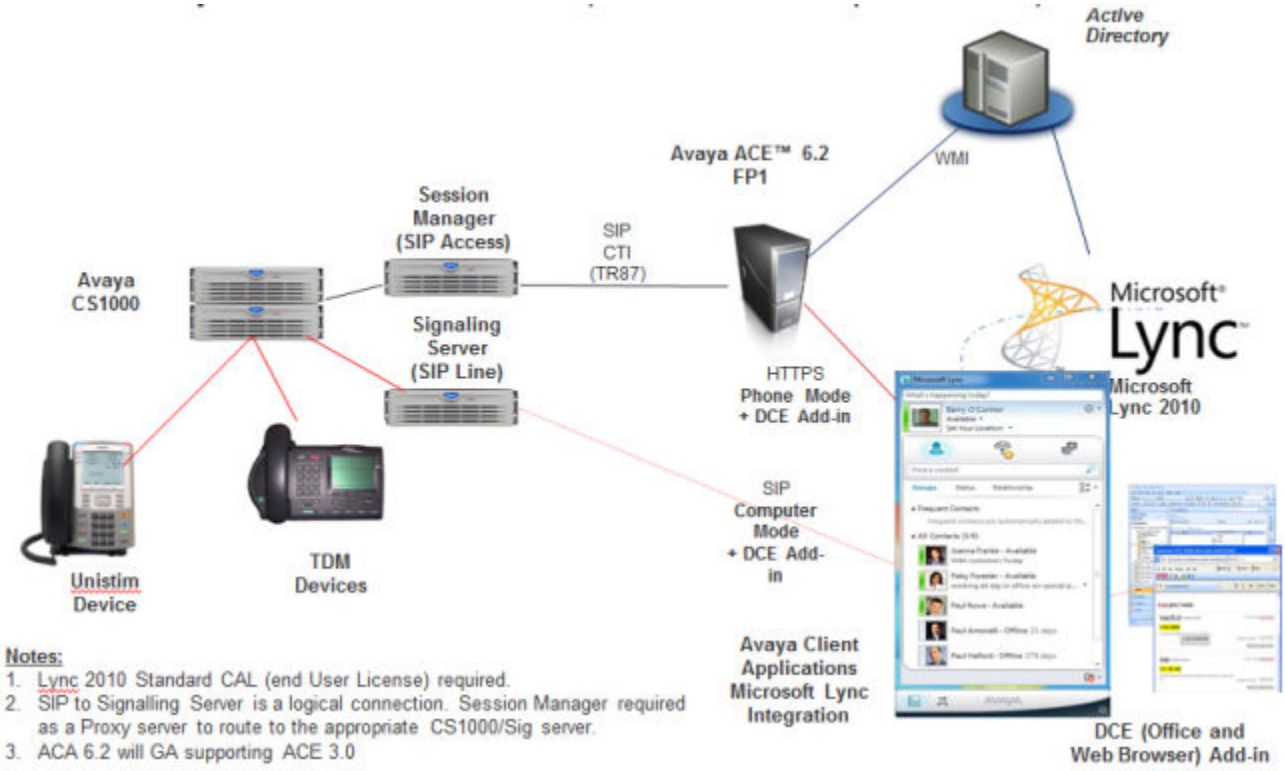


Figure 1: Avaya Lync Integration deployed in an Enterprise with Avaya ACE™ 6.2.1

Lync Integration support for Microsoft Office 365

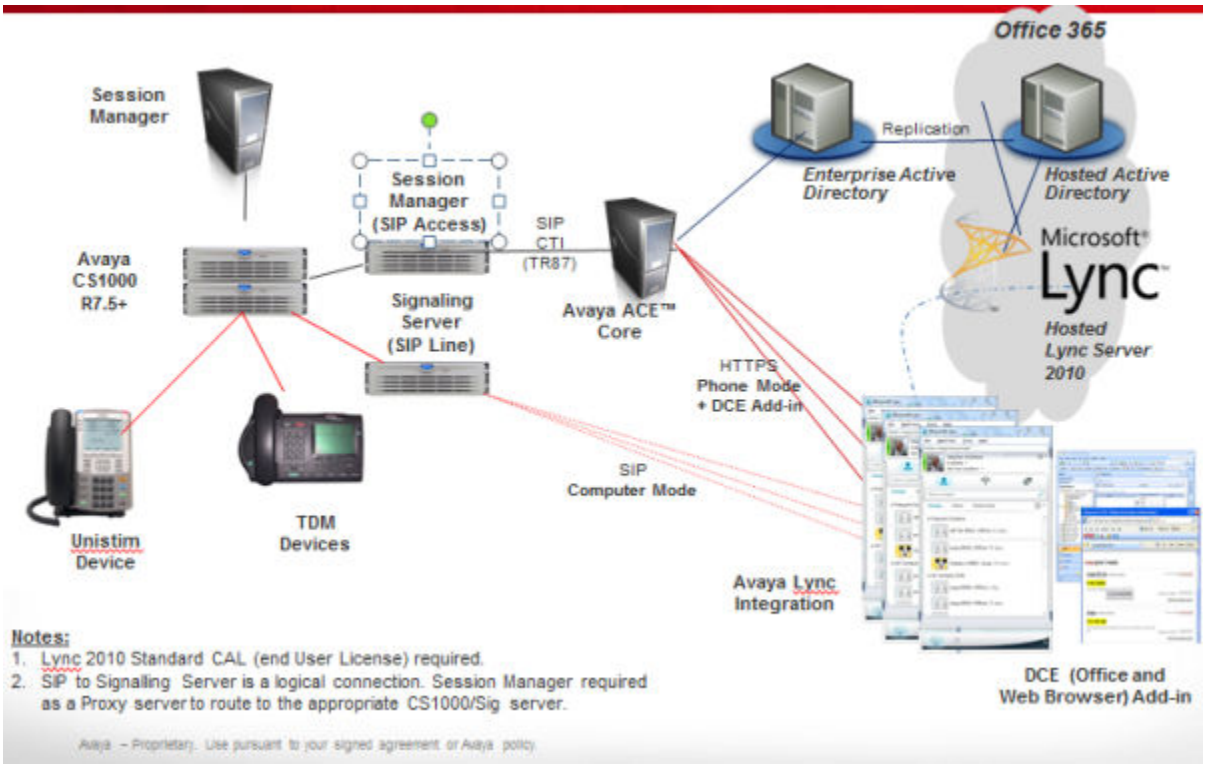


Figure 2: Avaya Lync Integration deployed in a Microsoft Office 365 environment with Avaya ACE 6.2.1

Authentication within an Office 365 deployment for CS 1000

Authentication is unchanged within an Office 365 deployment. Office 365 deployments do not require that Active Directory user data be replicated with a premise Active Directory. The Avaya Lync Integration solution requires a premise based Active Directory. When Lync Integration is in Phone mode, user authentication occurs within each web request to Avaya ACE 6.2.1, based on the user credentials of the work station hosting MOC. Avaya ACE 6.2.1 must be installed in Active Directory mode and both the Avaya ACE Core network and the client PC where Lync Integration is installed must be connected to the same domain. When Lync Integration is in Computer mode, authentication occurs between the Avaya UC engine and the Avaya CS 1000 service provider.

Chapter 4: Lync Integration key components

Lync Integration features the following key components.

Microsoft Lync 2010 client

Microsoft's Lync 2010 is the unified communication desktop client providing IM and presence capabilities to the overall solution. Microsoft's Lync Server delivers IM and presence aggregation services to the end user.

Avaya Microsoft Lync Integration

This is a client side add-in to Microsoft Lync 2010. It utilizes the Lync Client User interface to drive Avaya Voice capabilities to the end user. The Lync Integration operates in two modes. In Computer mode, it utilizes the Avaya Unified Communication (UC) desktop engine to deliver soft client functionality. In Phone mode, it provides CTI control over the end user's desk phone.

When deployed with the CS 1000 service providers, an Avaya ACE 6.2.1 server must be available for the Lync Integration to operate in Phone mode.

Microsoft Lync Server

The Microsoft Lync Server provides the end user with IM and Presence aggregation functionality. The Avaya Microsoft Lync Integration builds on this Lync functionality and its Lync client user interface to deliver an Avaya voice experience.

Microsoft Office Communicator

Microsoft Office Communicator is the unified communication desktop client providing IM and presence capabilities to the overall solution. Microsoft's Office Communications Server delivers IM and presence aggregation services to the end user.

Avaya Microsoft Communicator Add-in

This is a client side add-in to Microsoft Office Communicator 2007 R2. It utilizes the Office Communicator user interface to drive Avaya Voice capabilities to the end user. The Communicator Add-in operates in two modes. In Computer mode, it utilizes the Avaya Unified Communication (UC) desktop engine to deliver soft client functionality. In Phone mode, it provides CTI control over the end user's desk phone. A 6.2.1 Avaya ACE server must be available for the Communicator Add-in to operate in Phone mode.

Note:

The Microsoft Communicator Add-in does not support Computer mode for Avaya CS 1000.

Microsoft Office Communicator Server 2007 R2

Microsoft's Office Communicator Server (OCS) 2007 R2 provides the end user with IM and Presence aggregation functionality. The Avaya Microsoft Communicator Add-in builds on this OCS functionality and its Communicator client user interface to deliver an Avaya voice experience.

Active Directory

The Avaya ACE 6.2.1 networks access Active Directory to determine which OCS user to service. If the OCS user has an Avaya ACE profile, the 6.2.1 Avaya ACE server will deliver voice and telephony presence services to the user's Office Communicator client and allow this user to control the end devices registered in their profile.

Avaya ACE

Avaya ACE provides the integration point to the customer's multivendor communication system environment through vendor specific protocol adaptors. The Avaya ACE service interacts with these communication systems on a signaling basis only, and relies on the underlying communication infrastructure to control the media. This allows Avaya ACE to monitor and control end user devices. Avaya ACE maintains a profile of the end user's services and devices. One of the Avaya ACE services, ACE Address Manager, converts E.164 Numbers used by OCS to the number formats which can be used by the communication system.

Service providers

The following service providers are supported:

- Communications Server 1000 (Computer and Phone mode)

Supported desk phones (hardware)

All Avaya TR/87 desk phones that can be controlled on the CS 1000 service provider, such as the i200x and 11x0 series phones, are supported in Phone mode on the Avaya CS 1000 Lync Integration and Office Communicator add-ins.

Approved headsets

To obtain a list of approved headsets, perform the following steps.

1. Open a web browser and go to the DevConnect web site at http://www.avaya.com/devconnect.
2. In the navigation list on the left, select **Tested Solutions**.
3. Select the **Solution** tab.

4. Under **Solution Platform**, click the **one-X Communicator** check box.
5. Click **Search**.

   A list of approved headsets is displayed.

Client workstation

The machine where Lync Integration is installed must meet the following requirements:

Table 1: Hardware requirements

Processor	1.8 GHz
Memory	1 GB (Windows XP) 2 GB (Windows 7)
Disk space	100 MB
Audio device	An audio device must be available on the computer to use Lync Integration in Computer mode.
Connectivity	Download bandwidth: 80 kbps Upload bandwidth: 80 kbps

Table 2: Software requirements

Operating system	Microsoft Windows XP Service Pack 3, or higher Microsoft Windows 7
Microsoft .Net	For Lync, release 4.0 or higher. For Office Communicator, release 3.5, 4.0, or higher.
Microsoft Lync 2010 or Microsoft Communicator	Microsoft Lync 2010 version 4.0.7577.4103 or higher
	Microsoft Office Communicator 2007 R2, version 3.5.6907.253 or higher

Chapter 5: Lync Integration services

Avaya Lync Integration is client side. Avaya Lync Integration is an add-in application that extends Microsoft Office Lync 2010 functionality using Lync supported APIs. Lync Integration extends Lync 2010 by providing two telephony modes: Phone mode and Computer mode.

Integrating Lync Integration with Microsoft Lync 2010 enables telephony services in Lync 2010. Lync Integration customizes and configures Lync 2010 as part of its installation.

Note:

If you are using Lync 2010 over a Microsoft Remote Desktop session, it is recommended that you use Remote Desktop client version 6.1.7600.16385 or higher. Remote Desktop client software is available from the Microsoft web site. You should download the latest available version of the client as well as any available updates.

This chapter contains the following sections:

- Telephony services with Lync Integration on page 23
- Telephony presence with Lync Integration on page 29

Telephony services with Lync Integration

Lync Integration controls a single line, based on the user's primary line. If the user's desk phone supports multiple lines, non-primary lines will not be represented by Lync Integration.

The following table lists the functionality supported for Lync Integration with CS 1000.

Table 3: Telephony feature descriptions

Capability	Description
Make Call	Users can make a call on their phone by clicking on a contact in their contact list or entering a number in the Lync 2010 dialog box.
Release Call	Users can Release a phone call by clicking on the End Call icon in Lync Integration Conversation Bar.
Answer Call	Users can accept an incoming call that is presented to them via a pop-up window.
Deflect Call (redirect)	Users can redirect an incoming call that is presented to them via a pop-up window.

Capability	Description
Decline Call	Users can decline a phone call by clicking the **Decline Call** icon in the Lync Integration Incoming Call Notification dialog box. On the PBX line, the call is treated as an unanswered call.
Caller ID	Users receive Calling Party Name or Caller line ID in a popup window.
Forward Line	Users can activate Call Forward on their PBX line for incoming calls by selecting the Call Forward icon from the Lync Integration Lync 2010 Bar.
Call Hold and Retrieve	Users can place call on hold using the hold button within the Lync Integration Conversation Bar. The call may be retrieved by clicking somewhere within the text line when the call is in a held state.
Generate Digits (DTMF)	User can initiate sending of DTMF digits through the PBX system by selecting the dial pad icon on the Add-in Conversation Bar.
Consult Call	When on an active call, the user can: • answer a call • instigate a second call by clicking on a contact in their contact list or entering a number in the Lync 2010 dialog box When an additional call is answered or initiated, the previously active call is placed on hold. Multiple consult calls can be created.
Receiver Volume Control	Users can select to adjust the volume of the PC speaker(s) or headset receiver.
Microphone Mute	Users can select to mute or un-mute the PC speaker(s) or headset microphone.
Codecs supported	G.711A G.711MU G.722-64K G.722.1-24K G.722.1-32K G.729

Lync Integration desktop life cycle

Once installed, Lync Integration is launched as an end-user service when the user signs into Windows. The service waits in an idle state for the Lync 2010 client to launch, and for the user's Lync client to successfully sign in to the Lync server. At this point, Lync Integration will attempt to bind to its service provider. This takes between 5 seconds and 2 minutes, depending on network latency and workstation capacity. When the user signs out of the Lync client, Lync Integration will unbind from the active service provider and transition to the idle state.

Lync Integration can be launched from the Lync client's **Tools** menu by selecting **Avaya Microsoft Lync Integration**. If the menu option is not available, exit the Lync client and then relaunch.

The Lync Add-in may be restarted after the computer returns from sleep or after an intermittent network outage. When the Lync Add-in is restarted, the Add-in's conversation bar is attached to each conversation window. This makes the conversation window appear active even though nothing has changed in the window.

Lync Integration operational modes

Avaya Lync Integration supports the following operational modes:

- Phone
- Computer

Phone mode

Phone Mode allows Lync Integration to control the user's desk phone and is implemented using the following method:

- **Phone mode using Restful Session Control:** Phone mode using Restful Session Control integrates over Restful HTTP to Avaya ACE 6.2.1 to remotely control media anchored on the phone. Phone Mode using Restful Session Control is supported on Avaya CS 1000.

Computer mode

Computer mode allows the Lync or Communicator client to use the computer as a phone. Lync Integration uses Avaya UC Desktop Engine capabilities to use the media capabilities of the computer. Computer mode is only supported on the Lync client for CS 1000.

Feature support by communication system and mode

Note:

Video is not supported on standard CS 1000 deployments.

Table 4: Feature support by communication system and mode

Capability	CS 1000	
	Computer	Phone
Make Call	Y	Y
Release Call	Y	Y
Answer Call	Y	Y
Deflect Call (redirect)	N	Y
Decline Call	Y	Y
Caller ID	Y	Y

Capability	CS 1000	
	Computer	Phone
Forward Line	N	Y
Call Hold and Retrieve	Y	Y
Generate Digits (DTMF)	Y	Y
Consult Call	Y	N
Consult Transfer	N	N
Single Step Transfer (Blind Transfer)	N	N
Consult Conference	N	N
Call Waiting	Y	N
Call History	N	N
Receiver Volume Control	Y	not applicable
Microphone Mute	Y	not applicable
Codec's supported	Y	not applicable

Lync Integration telephony service limitations

Note:

- While Microsoft states that the Microsoft Communicator can connect and properly function with Microsoft Lync server, this configuration has not been tested.
- Avaya Lync Integration does not integrate with Microsoft Communicator.
- Avaya Communicator Add-in does not integrate with Microsoft Lync 2010.

Lync Integration telephone service has the following limitations.

Audio controls

- When a conversation is initiated, if the audio device setting is already at the lowest setting, Lync Integration does not present the conversation as muted.
- Audio Device settings may appear unsynchronized with the PC settings.
- Audio Settings cannot be adjusted from the **Settings** panel when a call is in progress.
- Lync Integration does not support call control using the headset directly. Call control must be invoked on the phone set, or using the Lync Integration application.

Avaya ACE component restarts

In Phone mode, Lync integration telephony services, including current call control, are disrupted after an Avaya ACE application restart. Call control, without Lync Integration services, is still available on the desk phone.

Lync server restarts

Avaya Lync Integration does not function during an OCS outage. Within Phone mode, mid-call control may return when OCS becomes available. Users retain the ability to use their desk phone to make calls until full functionality is restored.

If a user is on a Computer mode call when the Lync Server becomes unavailable, the call will be maintained, but mid-call control may be lost. The ability to end the call is maintained by a popup window. If the Lync client is able to reconnect to the Lync server prior to the call being completed, Lync Integration will begin providing service once the existing call is completed.

Lync client machine restarts

Active Computer mode calls are not terminated when a machine running the Lync 2010 client is restarted. The remote party can either wait for the call to reconnect or terminate the call. If the telephony infrastructure detects that the endpoint is no longer sending media, the call may be terminated.

Call Forwarding and Redirect

An incoming call originated by the user, which is eventually routed back to the originator, is not presented to the user. For example, a user sets call forwarding from device B to device A. The user then uses device A to call device B. Device A receives a ringback, but the user cannot accept the call. The call may route to No Answer treatment.

DTMF in Computer Mode

When entering DTMF digits into a conversation, the DTMF tone played back on the speaker may be picked up by the microphone. In this case, the digit sequence may be corrupted. There are two workarounds:

- Use a headset when inserting DTMF digits into a conversation
- Mute the microphone while DTMF digits are being inserted.

Multiple Avaya Unified Communication clients

Multiple Avaya UC Clients, with the exception of Avaya IP softphone, may be deployed on a user workstation, but only a single UC client can be used for telephony services at any time. Having multiple Avaya soft phone clients (such as Avaya one-X Communicator and Avaya Flare) logged in simultaneously on the same work station is not supported.

Multiple Lync Integration sessions

Microsoft Lync supports multiple client sessions for each user. However, Avaya Lync Integration does not. For each user, only a single Lync Integration session can be running.

Lync Integration cannot be deployed on a shared computer. To avoid contention for telephony resources, only a single session of Lync Integration can run on a workstation at any time.

Multiple published work phone numbers

Avaya Lync Integration cannot support multiple published work phone numbers. The published work phone number must match the number defined in Active Directory.

This limitation does not apply to the Avaya Office Communicator Add-in.

Unique work phone numbers for all users

All Lync Integration users must publish unique phone numbers in the Microsoft Address Book. Multiple users cannot publish the same work phone number in their Lync clients.

Common phone numbers for multiple users

Multiple Lync Integration users should not publish the same Home, Mobile, or Other phone number in the Lync client. If multiple users have a common phone number, such as a reception or hunt group phone number, the users must create a new contact for the common phone number.

Multiple calls to the same contact

Only one Conversation window can be active against a Lync contact at a time. If a user needs to make a second call to the same contact while already on another active call with that contact, the user must make the call by entering the contact's alternative phone number in the Lync Search bar or by creating a separate contact for the phone number.

Telephony control of the desk phone

Telephony control of the desk phone requires that the phone be logged in. If the phone is not logged in, call control operations cannot occur on the desk phone.

The Lync Add-in appears to operate normally even when the desk phone is not logged in.

Conference calls with the People Options button

In a Lync or Communicator Conversation window, users cannot use the **People Options** button to escalate a call or an instant messaging conversation to a conference call. The **People Options** button can only be used to add people to an instant messaging conversation.

Telephony service limitations specific to CS 1000

Phone mode

The CS 1000 does not support CTI control of SIP phones. Therefore, Phone mode is not supported for SIP devices.

Computer mode

- The CS 1000 does not support Computer mode with the Communicator client.
- When in Computer mode, it is recommended that you use Avaya Lync Integration for all call handling. If a call is originated or answered on the desk phone while in Computer mode, it is not possible to control the call using the Avaya Lync Integration. To provide mid call control for your desk phone, switch to Phone mode prior to originating or answering the call.

- If a user's Primary DN is idle but the Transfer feature key is busy, a new outgoing call is not allowed and is blocked with the warning message: “Unable to make a new call. Please wait for the first call to complete.”
- The CS 1000 SIP client does not support the multiple registration feature, and therefore, is limited to two lines. Avaya Lync Integration blocks an attempt to initiate a third call.
- The CS 1000 SIP client does not support multiple registration, and therefore, prevents a call being made to a user with another call on hold. An attempt to initiate a call to a user with another call on hold results in the call being disconnected.
- The Avaya Lync Integration for CS 1000 supports only a single DN per phone. Multiple DN and Group DN features are not supported.

Telephony presence with Lync Integration

The Lync Integration telephony presence implementation enables the **Busy – In A Call** status for a Lync 2010 user. Other Lync 2010 users see the appropriate presence status depending on their relative level of access. Lync Integration publishes the **Busy – In A Call** status when the user initiates a call, or when the user answers an incoming call. If the user has a call on hold, then **Busy – In a Call** is still published. If the user is part of multiple calls, **Busy – In A Call** is published until Lync Integration detects that the user is not part of any call. The **Busy – In a Call** presence is an application state that should not be selected manually. If the user is not in a call and manually changes the presence state to **Busy – In a Call**, Lync Integration automatically changes the presence state back to **Available**.

The Custom Presence definition file is provided as a configuration item within the Lync Integration installation package. When custom presence is enabled on Lync 2010, the presence option **Busy – In A Call** is available in the list of presence options.

Do Not Disturb

While the Lync 2010 user presence status is **Do Not Disturb**, incoming call notifications are not presented on the user's computer. In Phone mode, the telephony device will continue to ring, and can be answered.

Lync Integration presence service limitations

When in Phone mode, even if the presence status is **Do Not Disturb**, the phone will ring.

Chapter 6: Dialing rules fundamentals

By default, Lync Integration uses the configured dial plan information specified in the Configurator or defined within the Lync Integration **Settings** panel. These dial plan settings normalize phone numbers and match presented phone numbers with Lync contacts. Dialing between users must be either extension dialing or E.164 dialing. In this document, this is referred to as a simple dial plan.

Simple dial plans are not always specific enough to handle all types of phone numbers. For these scenarios, an advanced dial plan must be configured. With an advanced dial plan, it is possible to manipulate incoming and outgoing phone numbers by creating a `dialingRules.xml` file.

Important:

A dial plan only needs to be configured for CS 1000 in Computer mode.

- Supported phone number formats on page 31
- Simple dial plan on page 33
- Advanced dial plan on page 36

Supported phone number formats

Lync Integration normalizes phone numbers, as presented when a call is ringing, into a format that matches Lync contacts. Lync Integration also takes the phone numbers of Lync contacts and makes them dialable for the call server. These normalizations and dialable transformations can only be performed in CS 1000 Computer mode, where a simple or advanced dial plan is provisioned.

The following sections describe the supported phone number formats for CS 1000 in Phone mode, Computer mode, and both Phone and Computer mode.

CS 1000 Computer mode

In CS 1000 Computer mode, phone numbers published in the Lync client can be entered in one of the following formats as long as the appropriate dial plan is in place to support it:

- E.164 DID
- Extension
- E.164 non-DID

The following table provides an example and a description for each of the number formats listed above.

Table 5: Supported phone number formats

Format	Example	Description
E.164 DID	+17776671234	A number in the E.164 format with no extension at the end.
Extension	1234	An extension number. These types of numbers are not preceded by a +. Phone numbers entered in this format are not fully qualified and require dialing rules.
E.164 non-DID	+17776670000 x1234	A number in the E.164 format with an extension at the end. The first part of the number describes the switchboard or reception from which you can request the extension number.

Even though advanced dial plan transformations could theoretically allow for any mixture of number formats in Lync contacts, in practice a limited number of transformations will be put in place to normalize all numbers into the same format within an enterprise. This means that all Lync contact numbers within an enterprise should be presented in the same format so that a search and match can be performed.

Important:

The three supported number formats for Lync Integration are not all immediately supported by the Microsoft Lync Address Book. The Microsoft Lync server needs to be configured to understand the allowable number formats when obtaining numbers from the Active Directory and inserting them in the Lync Address Book. See documentation on the Microsoft web site for more information about the `Company_Phone_Number_Normalization_Rules.txt` file and the Lync Server Resource Kit Tools – ABSConfig Tool.

Phone numbers for contacts outside the enterprise are always presented in E.164 DID format so that the default simple dial plan will normalize and correctly match those numbers with the Lync contacts.

CS 1000 in Phone mode

A Lync Integration dial plan is not available for CS 1000 in Phone mode, so all phone numbers published in the Lync client must be entered in the E.164 DID format with no extension at the end. For more information about this format, see Table 5: Supported phone number formats on page 32.

CS 1000 in both Phone and Computer mode

If the Lync Integration user plans to switch between CS 1000 Computer mode and CS 1000 Phone mode, a dial plan is available for CS 1000 Computer mode but not for CS 1000 Phone mode. For consistency between the two modes, the dial plan must normalize all numbers to the E.164 DID format. Therefore, all numbers published within the Lync client must be entered in the E.164 DID format. For more information about this format, see Table 5: Supported phone number formats on page 32.

Related topics:

Supported phone number format limitations on page 33

Supported phone number format limitations

Supported phone number formats in Lync Integration have the following limitations.

- Microsoft Lync supports E.164 DID phone numbers, extensions, and E.164 non-DID phone numbers. However, the display of E.164 non-DID phone numbers is incorrect if the phone number is not a North American phone number starting with +1. When deploying systems outside North America, use the extension phone number format or the E.164 DID format.
- Microsoft Office Communicator R2 only supports E.164 DID and extension phone number formats. The Communicator client does not support the E.164 non-DID phone number format.

Recommendations

Do not leave users to publish their own phone numbers in the Lync or Communicator clients. Instead, enter the work phone number for all users in the enterprise in Active Directory. This allows for consistent phone number formatting throughout the enterprise.

Simple dial plan

You must configure a dial plan to enable the telephony features of Avaya Lync Integration. You can configure a default dial plan in the Configurator when building the Lync Integration install package. Users can also modify the dial plan in the Lync Integration **Settings** window by selecting the **Dialing Rules** tab.

Simple dial plan examples

North American dial plan example

E.164 Number +1 613 77[67] xxxx	
Number to dial to access an outside line	9
Your country code	1
Your area/city code	613
PBX Main Prefix	777
Number to dial for long distance calls	1
Number to dial for international calls	011

Extension length for internal extensions calls	4
Length of national phone numbers (including area/city code)	10
Include area/city code when making a local call	check

Results using a simple dial plan: North America

Dialed number is	Dialing number as	Entered number	Dialed number
Extension	E.164	+16133568293	8293
	International	01116133568293	901116133568293
	National	6133568293	8293
	Local	3568293	8293
	Extension	8293	8293
	Short code	500	500
Local	E.164	+16139078177	96139078177 (Include area code) or 99078177
	International	01116139078177	901116139078177
	National	6139078177	96139078177 (Include area code) or 99078177
	Local	9078177	99078177
National	E.164	+19088485596	919088485596
	International	01119088485596	901119088485596
	National	19088485596	919088485596
	Short code	911	911
International	E.164	+441628515068	9011441628515068
	International	011441628515068	9011441628515068

United Kingdom dial plan example

E.164 Number +44 1628 5xxxxx	
Number to dial to access an outside line	9
Your country code	44
Your area/city code	01628
PBX Main Prefix	5

Number to dial for long distance calls	0
Number to dial for international calls	00
Extension length for internal extensions calls	5
Length of national phone numbers (including area/city code)	10, 11
Include area/city code when making a local call	uncheck

Results using a simple dial plan: United Kingdom

Dialed number is	Dialing number as	Entered number	Dialed number
Extension	E.164	+441628515068	15068
	International	00441628515068	900441628515068
	National	01628515068	15068
	Local	515068	15068
	Extension	15068	15068
	Short code	4190	4190
Local	E.164	+441628777700	901628777700 (Include area code) or 9777700
	International	00441628777700	900441628777700
	National	01628777700	901628777700 (Include area code) or 9777700
	Local	777700	9777700
National	E.164	+441483308721	901483308721
	International	00441483308721	900441483308721
	National	01483308721	901483308721
	Special number	08001111	908001111
	Short code	999	999
International	E.164	+16133568293	90016133568293
	International	0016133568293	90016133568293

Advanced dial plan

Simple dialing rules may not be specific enough to handle all situations. Advanced dialing rules may be needed to:

- Interpret any numbers dialed and convert them into a form that can be used by the PBX.
- Match call progress updates with the display of the call in progress.
- Take incoming numbers and normalize them into the correct form to find the associated Lync contact.
- Match the normalized numbers to contacts from the user's Outlook or Active Directory contact list.

Simple dialing rules alone may not be enough to perform these operations. See the following examples.

Operation	Extensions cannot be defined as a number of digits at the end of full E.164 numbers.
Example	E.164: +441628433000 - +441628434999 > Extension: 3000 - 4999

Operation	There is not a direct relation between extensions and their E.164 representations.
Example	E.164: +441628515000 - +441628515999 > Extension: 55000 - 55999

Operation	The PBX serves a number of locations with different country and area/city codes.
Example	Extension: 3000 > E.164: +441628433000 Extension: 4000 > E.164: +35391734000

Operation	A company uses private network dialing between sites.
Example	Local Extension: 3000 > E.164: +441628433000 Remote Extension: 3563000 > E.164: +35391733000

Operation	The PBX presents other special numbers to the phones that are not directly convertible into E.164 form.

Operation	The PBX presents a number that should not be turned into an E.164 number when looking for a Lync contact because the contact's phone number is expected to contain an extension number.

Example	Extension: 3000 > Extension: 3000. This is an example of an advanced rule that matches an extension and leaves the number unchanged so that the simple dial plan does not get a chance to normalize the extension to an E.164 number.

When the simple dialing rules are not sufficient, it is possible to manipulate incoming and outgoing phone numbers by creating a `dialingRules.xml` file. This file defines patterns used to match incoming or outgoing numbers which are then manipulated by inserting and removing digits.

Dialing plans may differ per site or region and must be managed appropriately.

When crafting the advanced dialing rules, you must consider all of the possible number forms that are to be sent and received. See Simple dial plan examples on page 33 for examples of dialable translations, and the advanced dial plan examples below for the normalized translations.

Important:

Advanced dialing rules must be tested before they are deployed. Lync Integration will not generate error messages if the `dialingRules.xml` file contains incorrect dialing rules.

Advanced dial plan examples

North American dial plan example

E.164 Number + 1 613 77[67] xxxx	
Number to dial to access an outside line	9
Your country code	1
Your area/city code	613
PBX Main Prefix	777
Number to dial for long distance calls	1
Number to dial for international calls	011
Extension length for internal extensions calls	4
Length of national phone numbers (including area/city code)	10
Include area/city code when making a local call	check

Example of outside line digit not removed in number received to displayed number: North America

Received number is	Received number as	Number received	Number displayed
Extension	Extension	8293	+16133568293
Short code	Short code	500	500
Local	National	96139078177	+16139078177
	Local	99078177	+16139078177
National	National	919088485596	+19088485596
Short code	Short code	9911	911
International	International	011441628515068	+441628515068

United Kingdom dial plan example

E.164 Number + 44 1628 5xxxxx	
Number to dial to access an outside line	9
Your country code	44
Your area/city code	01628
PBX Main Prefix	5
Number to dial for long distance calls	0
Number to dial for international calls	00
Extension length for internal extensions calls	5
Length of national phone numbers (including area/city code)	10, 11
Include area/city code when making a local call	uncheck

Example of outside line digit not removed in number received to displayed number: United Kingdom

Received number is	Received number as	Number received	Number displayed
Extension	Extension	55068	+441628515068
Short code	Short code	4190	4190
Local	National	901628777700	+441628777700
	Local	9777700	+441628777700

Received number is	Received number as	Number received	Number displayed
National	National	901483308721	+441483308721
Special number	Special number	908001111	08001111
Short code	Short code	9999	999
International	International	90016133568293	+16133568293

The dialingRules.xml file

The `dialingRules.xml` file contains the advanced dialing rules. This file is read by the Lync Integration at start up. The following conditions apply to an advanced dial plan using a `dialingRules.xml` file.

- Rules defined in the `dialingRules.xml` file have to match and complete any digit manipulation on their own. If a number is matched and transformed by a `dialingRules.xml` pattern then no further change will be made by the simple dialing rules.
- The order of the rules in the `dialingRules.xml` file is important as these are checked in order and only the first match takes effect.
- If no `dialingRules.xml` patterns are matched then the simple dialing rules are applied.

Dialing rules contained in the `dialingRules.xml` file are applied only when using Lync Integration. They are not applied when using the desk phone. As a result, telephone numbers may be presented differently in Lync Integration and the desk phone.

You can create a `dialingRules.xml` file using the Avaya one-X® Communicator Centralized Administration Tool (CAT) or by using a text editor.

Deploy the `dialingRules.xml` using the Configurator. When you are performing the procedure to build the install package using the Configurator, you can specify the `dialingRules.xml` file to be included.

You can make changes to the `dialingRules.xml` file without reinstalling the Lync Integration software. Modify the `dialingRules.xml` using the CAT and deploy the new file using the `updateRules.wsf` tool. Changes to this file will take effect at the next Lync 2010 sign in.

Note:

If the new dial plan rules are not applied after a Lync 2010 client restart, reboot the workstation to ensure that the Lync Integration process has been restarted.

dialingRules.xml file example

Pattern	Type	Prefix	Delete Length	Min Length	Max Length
\+441628515[0-4]	Dialable	5	9	13	13
4190	Normalize	+441483309700	4	4	4
^55[0-4]	Normalize	+44162851	1	5	5
^5[89]	Normalize	+44148330	1	5	5

Below is a sample `dialingRules.xml` file based on the above table.

Note:

The `DialingRulesPatternList` string that begins on the second line is a single string on one line. Do not introduce carriage return characters into the string. If you cut and paste from this document, the string will contain carriage returns. Ensure that you remove any carriage returns that are introduced.

The `DialingRulesPatternList` string is composed of four segments separated by spaces. The line below indicates the location of the spaces.

```
<DialingRulesPatternList<space>xmlns:xsi="http://www.w3.org/2001/
XMLSchema-instance"<space>xmlns:xsd="http://www.w3.org/2001/
XMLSchema"<space>xmlns="http://xml.avaya.com/endpointAPI">
```

```
<?xml version="1.0" encoding="utf-8"?>
<DialingRulesPatternList xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://xml.avaya.com/
endpointAPI">
  <!-- Turn extensions dialed as E.164 numbers into extensions -->
  <DialingRulesPattern>
    <type>0</type>
    <pattern>\+441628515[0-4]</pattern>
    <subString>5</subString>
    <minLength>13</minLength>
    <maxLength>13</maxLength>
    <deleteLength>9</deleteLength>
  </DialingRulesPattern>
  <!-- Displayed number when calling voicemail, display as voicemail E.164 number -->
  <DialingRulesPattern>
    <type>1</type>
    <pattern>4190</pattern>
    <subString>+441483309700</subString>
    <minLength>4</minLength>
    <maxLength>4</maxLength>
    <deleteLength>4</deleteLength>
  </DialingRulesPattern>
  <!-- Displayed number is local extension, display as E.164 number -->
  <DialingRulesPattern>
    <type>1</type>
    <pattern>^55[0-4]</pattern>
    <subString>+44162851</subString>
    <minLength>5</minLength>
    <maxLength>5</maxLength>
    <deleteLength>1</deleteLength>
  </DialingRulesPattern>
```

```
  <!-- Displayed number is extension from another site, display as E.164 number -->
  <DialingRulesPattern>
    <type>1</type>
    <pattern>^5[89]</pattern>
    <subString>+44148330</subString>
    <minLength>5</minLength>
    <maxLength>5</maxLength>
    <deleteLength>1</deleteLength>
  </DialingRulesPattern>
  <DialingRulesPattern>
    <type>1</type>
    <pattern>^9[1-9]</pattern>
    <subString>+441628</subString>
    <minLength>7</minLength>
    <maxLength>7</maxLength>
    <deleteLength>1</deleteLength>
  </DialingRulesPattern>
    <DialingRulesPattern>
    <type>1</type>
    <pattern>^90[1-9]</pattern>
    <subString>+44</subString>
    <minLength>11</minLength>
    <maxLength>12</maxLength>
    <deleteLength>2</deleteLength>
  </DialingRulesPattern>
   <DialingRulesPattern>
    <type>1</type>
    <pattern>^900[1-9]</pattern>
    <subString>+</subString>
    <minLength>7</minLength>
    <maxLength>32</maxLength>
    <deleteLength>3</deleteLength>
  </DialingRulesPattern>
</DialingRulesPatternList>
```

Additional dialing rule scenarios

Incoming calls from 6133568 prefix cannot be normalized to match the E.164 numbers.

Incoming rule: Insert the +1 to properly normalize the incoming dialed number.
Example:
`<DialingRulesPattern>`
`<type>1</type>`
`<pattern>^6133568</pattern>`
`<subString>+1</subString>`
`<minLength>10</minLength>`
`<maxLength>10</maxLength>`
`<deleteLength>0</deleteLength>`
`</DialingRulesPattern>`

Outgoing calls to the 1613967 require the leading 1 to be passed to Communication Manager because 613967 is a toll call, but other calls to 1613 are not toll calls.

E.164 number: +1613967XXXX
Outgoing rule: Detect pattern and pass number.
Example:
`<DialingRulesPattern>`
`<type>0</type>`

Outgoing calls to the 1613967 require the leading 1 to be passed to Communication Manager because 613967 is a toll call, but other calls to 1613 are not toll calls.

```
        <pattern>1613967</pattern>
        <subString></subString>
        <minLength>10</minLength>
        <maxLength>12</maxLength>
        <deleteLength>0</deleteLength>
</DialingRulesPattern>
```

Incoming call from extension 4190 to be presented as +35391733380

Incoming rule: Detect pattern and replace with +35391733380.
Example:

```
<!-- Short code expansion -->
  <DialingRulesPattern>
    <type>1</type>
    <pattern>4190</pattern>
    <subString>+35391733380</subString>
    <minLength>4</minLength>
    <maxLength>4</maxLength>
    <deleteLength>4</deleteLength>
  </DialingRulesPattern>
```

These rules apply when the internal extension is not a subset of the published E.164 number.

Outgoing rule: Change published E.164 prefixes of 16137778xxx to extension 9xxx.
Example:

```
<DialingRulesPattern>
        <type>0</type>
        <pattern>16137778</pattern>
        <subString>9</subString>
        <minLength>10</minLength>
        <maxLength>12</maxLength>
        <deleteLength>9</deleteLength>
</DialingRulesPattern>
```

Outgoing rule: Variation on change published E.164 prefixes of 16137778xxx to extension 9xxx.
Example:

```
<DialingRulesPattern>
        <type>0</type>
        <pattern>16137778</pattern>
        <subString>9</subString>
        <minLength>10</minLength>
        <maxLength>12</maxLength>
        <deleteLength>8</deleteLength>
</DialingRulesPattern>
```

Outgoing rule: Incoming notification, with a 4 digit extension starting with 99xx, will be converted to 161377789xx.
Example:

```
<DialingRulesPattern>
        <type>1</type>
        <pattern>99</pattern>
        <subString>+16137778</subString>
```

These rules apply when the internal extension is not a subset of the published E.164 number.

```
        <minLength>4</minLength>
        <maxLength>4</maxLength>
        <deleteLength>1</deleteLength>
</DialingRulesPattern>
```

Advanced dialing rules when an enterprise is using extensions for Lync enterprise contact phone numbers

If using extensions for enterprise contacts' phone numbers, then the simple and advanced dialing rules should aim to normalize all enterprise numbers into extensions when possible. All numbers outside the enterprise should resolve to E.164 numbers. The dialable rules should similarly turn all enterprise numbers into extensions and all non-enterprise numbers into numbers that can be dialed with the appropriate prefixes. The simple dialling rules will try to normalize all numbers into E.164 numbers so advanced rules are needed to convert enterprise numbers into extensions.

Example:

The following normalization rule keeps 4 digits extensions starting with 5 unchanged rather than converting them to E.164 numbers (normalize: 5xxx -> 5xxx)

```
<?xml version="1.0" encoding="utf-8" ?>
<DialingRulesPatterList xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://
xml.avaya.com/endpointAPI">
<DialingRulesPattern>
<type>1</type>
<pattern>^5</pattern>
<subString />
<minLength>4</minLength>
<maxLength>4</maxLength>
<deleteLength>0</deleteLength>
</DialingRulesPattern>
</DialingRulesPatternList>
```

Advanced dialing rules when an enterprise is using non-DID extensions for Lync enterprise contact phone numbers

Example:

+441628515000 x5001

If using non-DID E.164 numbers with extensions for enterprise contacts then the simple and advanced dialling rules should aim to normalize all enterprise numbers into extensions when possible except for the common reception or IVR E.164 number. All numbers outside the enterprise should resolve to E.164 numbers. The dialable rules should similarly turn all enterprise numbers into extensions and all non-enterprise numbers into numbers that can be dialed with the appropriate prefixes. The simple dialing rules will try and normalise all numbers into E.164 numbers so advanced rules are needed to convert enterprise numbers into extensions.

If non-DID E.164 numbers with extensions are used in an enterprise then all Lync users must have their work numbers set in this format.

Example:

Advanced dialing rules when an enterprise is using non-DID extensions for Lync enterprise contact phone numbers

This normalization rule converts the reception number into an E.164 format, but keeps the extension number unchanged. The following example shows the normalization rule for an E-164 number, with a 4 digit extension starting with 5 at the end (normalize: 5xxx -> 5xxx)

```
<?xml version="1.0" encoding="utf-8" ?>
<DialingRulesPatternList xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://
xml.avaya.com/endpointAPI">
<DialingRulesPattern>
<type>1</type>
<pattern>^5</pattern>
<subString />
<minLength>4</minLength>
<maxLength>4</maxLength>
<deleteLength>0</deleteLength>
</DialingRulesPattern>
</DialingRulesPatternList>
```

Chapter 7: Work flow for deploying Lync Integration

This section illustrates the high level work flow required to deploy Avaya Lync Integration and lists the requirements for the network components.

In this document, the term Lync Integration will be used to refer to both Lync Integration and Communicator Add-in unless specific Communicator Add-in features are being highlighted. Unless specified, the Communicator Add-in installation steps are identical to that of Lync Integration.

Lync Integration deployment notes

The following limitations apply to the deployment of Lync Integration.

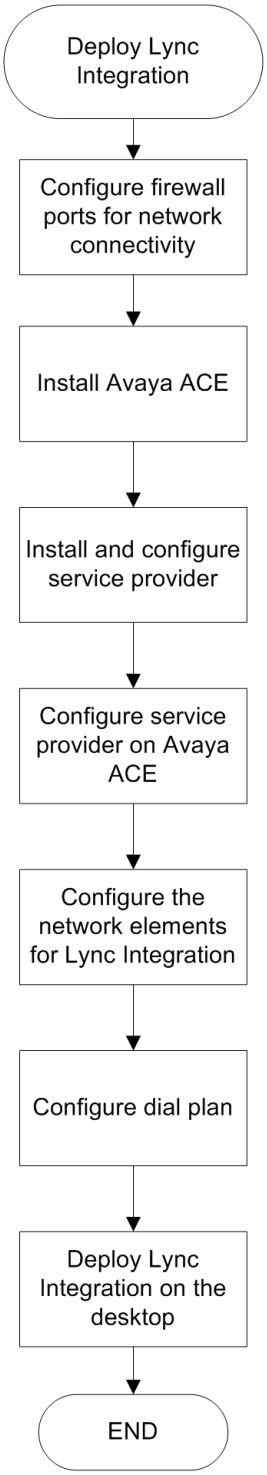
- The Avaya Lync Integration builds on Lync's IM and Presence capabilities. This requires the Lync 2010 Standard CAL . Upon deployment of Lync Integration, the Microsoft Lync 2010 UC (Voice and Video) capabilities are disabled.
- Lync Integration cannot be installed in conjunction with any other Lync Extension.
- Lync Integration supports a single extension per end user.
- Lync Integration does not support SIP endpoints
- Lync Integration may not integrate with other 3rd party add-ins to the Microsoft Lync software. If Lync Integration fails to load after the installation of a 3rd party add-in, you must reinstall Lync integration.
- If Lync Integration and one-X Communicator are installed on the same machine, the one-X Communicator must be installed with the following functions set to **Disabled**:

    - ENABLECLICKTODIALIE
    - ENABLECLICKTODIALFF
    - ENABLEOUTLOOKADDIN

  See the **Silent Installation** section in *Overview and Planning for Avaya one-X® Communicator*.

Deploying Lync Integration work flow

The work flow shows the tasks you perform to deploy Lync Integration.


Deploy Lync Integration
Configure firewall ports for network connectivity
Install Avaya ACE
Install and configure service provider
Configure service provider on Avaya ACE
Configure the network elements for Lync Integration
Configure dial plan
Deploy Lync Integration on the desktop
END

Navigation

- **Configure firewall ports for network connectivity:** see Port configuration on page 49
- **Install Avaya ACE:** see *Avaya Agile Communication Environment™ Planning and Installation* (NN10850–004)
- **Install Avaya ACE Application Integration Engine:** see *Avaya Agile Communication Environment™ Application Integration Engine Fundamentals* (NN10850–021)
- **Install and configure service provider:** see the requirements listed in Configure a dial plan on page 61
- **Configure service provider on Avaya ACE:** see *Avaya Agile Communication Environment™ Service Provider Administration* (NN10850–005)
- Configure the network elements for Lync Integration on page 57
- Deploy Lync Integration on the desktop on page 69

Chapter 8: Port configuration

Firewall rule configuration is required for the solution deployment to work. This may require advance planning in order to comply with customer site IT governance and policy enforcement.

Port configuration is required for the following network elements:

- **Avaya ACE:** See
  - The requirements and references listed under Service provider configuration on page 51.
  - The port usage information in *Avaya Agile Communication Environment™ Planning and Installation* (NN10850–004).
- **Client PC:** The Windows firewall is automatically traversed by Lync Integration. However, for Computer Mode, a firewall rule may be required to traverse proprietary firewalls.
- **SIP Line Gateway service:** For Lync Integration in Computer mode, you must configure the following SLG Local SIP and TLS ports on the SIP Line Configuration Detail page. For more information, see “Configure the SIP Line Gateway service” in *SIP Line Fundamentals Avaya Communication Server 1000* (NN43001-508).

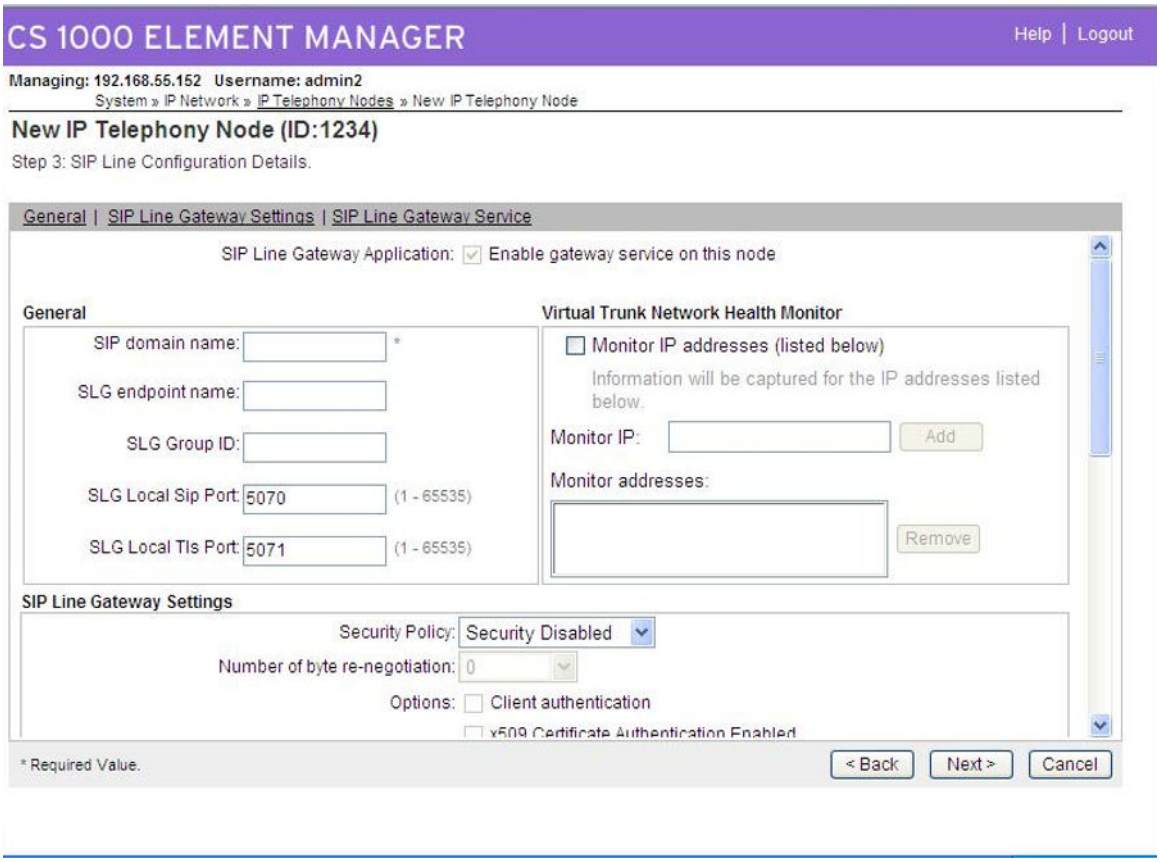


Figure 3: New IP Telephony Node–SIP Line Configuration Details

Chapter 9: Service provider configuration

Your service provider must be installed and functional. The service provider requirements are described in the following sections.

Avaya Communication Server 1000 requirements

The Avaya CS 1000 service provider must be configured to use the TR/87 protocol. See the information on TR/87 solutions in *Avaya Agile Communication Environment™ Service Provider Administration* (NN10850–005).

On the CS 1000, the line must be provisioned such that a DN has two TNs:

- one as a Unistim or Digital Phone, for Phone Mode
- one as an SIPN for Computer Mode

For more information , see *SIP Line Fundamentals Avaya Communication Server 1000* (NN43001-508). For a configuration example, see Avaya CS 1000 TN configuration on page 51.

Avaya CS 1000 TN configuration

Computer mode CS 1000 TN configuration prompts

Prompt	Description
TYPE UEXT	Universal extension. Indicates that the TN is used by a universal extension IP Phone. CS1000 Mobile Extension package (412) must be equipped.
UXTY SIPL	Universal Extension type.
MCCL YES	The Maximum Client Count Limit, which is the number of IP Phones supported for each SIP type. Yes is for One-XCE. SIP3 type = SIP Line for 3rd-party IP Phones. 0 is for One-XCE. SIPN type = SIP Line for IP Phones. 1 is for One-XCE
SIP3 0	
SIPN 1	
SIPU 9615	The ID for the SIP Line user. Lync Integration requires providing sip user name only as his primary line. In the example below, primary line is 9615.

Prompt	Description
KEY 00 SCR 9615 0	Key 0 SCR defines primary dialing number (PDN). In current implementation, only single call ringing (SCR) mode is available. The second digit defines Calling Line Identification (CLID). The default value is 0.
01 HOT U 1479615	The UADN key number. If UAPR was configured in Customer data block, the DN is automatically generated as UAPR+PDN. In this example, UARP is 147.
SCPW 1111	IP Phone registration requires a password. All IP Phone passwords are defined as a Station Control Password (SCPW). To obtain the SCPW prompt, you must configure the Station Control Password Length (SCPL) to the desired number of digits in Flexible Features Codes data in Customer Data Block. You must also configure DFLT_SCPW to NO (which is the default value). In the example below, SCPW is 1111.
CLS	Station-to-Station Call Waiting Allowed. A Call Waiting key or CWT must be defined. Value = SWA HTD.
KEY X	Call Wait. This line will be used for incoming consult call. X is a key number. For example, call wait line could be configured on the third button. Value = CWT.
KEY X	Transfer. This line will be used for outgoing consult call. X is a key number. Please note, that the default configuration has KEY 17 TRN configured.

Computer mode CS 1000 TN configuration example

```
DES  UEXT
TN   096 0 02 01  VIRTUAL
TYPE UEXT
CDEN 8D
CTYP XDLC
CUST 0
UXTY SIPL
MCCL YES
SIPN 1
SIP3 0
FMCL 0
TLSV 0
SIPU 9615
NDID 4007
SUPR NO
SUBR DFLT MWI RGA CWI MSB
UXID
NUID
NHTN
CFG_ZONE 08000
CUR_ZONE 08000
MRT
ERL  0
ECL  0
```

```
VSIT NO
FDN
TGAR 0
LDN  NO
NCOS 0
SGRP 0
RNPG 0
SCI  0
SSU
XLST
SCPW 1111
SFLT NO
CAC_MFC 0
CLS  CTD FBD WTA LPR MTD FND HTD TDD HFD CRPD
     MWD LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
     POD SLKD CCSD SWA LND CNDD
     CFTD SFD MRD DDV CNID CDCA MSID DAPA BFED RCBD
     ICDD CDMD LLCN MCTD CLBD AUTU
     GPUD DPUD DNDD CFXD ARHD CLTD ASCD
     CPFA CPTA ABDD CFHD FICD NAID BUZZ AGRD MOAD
     UDI RCC HBTD AHA IPND DDGA NAMA MIND PRSD NRWD NRCD NROD
     DRDD EXR0
     USMD USRD ULAD CCBD RTDD RBDD RBHD PGND FLXD FTTC DNDY DNO3 MCBN
     FDSD NOVD VOLA VOUD CDMR PRED RECD MCDD T87D SBMD ELMD
     MSNV FRA  PKCH MWTD DVLD CROD ELCD
CPND_LANG ENG
HUNT
PLEV 02
PUID
UPWD
DANI NO
AST
IAPG 0
AACS NO
ITNA NO
DGRP
MLWU_LANG 0
MLNG ENG
DNDR 0
KEY  00 SCR 9615 0     MARP
     01 HOT U 1479615 MARP 0
     02
     03 CWT
     04
     05
     06
     07
     08
     09
     10
     11
     12
     13
     14
     15
     16
     17 TRN
     18 AO6
     19 CFW 16
     20 RGA
     21 PRK
     22 RNP
     23
     24 PRS
     25 CHG
```

```
     26 CPN
     27
     28
     29
     30
     31
DATE 10 OCT 2011
```

CS 1000 Phone mode configuration prompts

Prompt	Value	Configuration
CLS	T87A CDMR	Determines the calling options and features available to the telephone. By default, TR87 feature is denied. Converged Desktop Multimedia feature is Restricted (CDMR) by default.
AST	00	Defines key number to be used as the monitor key. Make sure that a Single Call Ringing (SCR) key number is assigned, for example, 00 for Key 0. You cannot choose any key. Some keys are pre-assigned or reserved for other features. Each terminal number requires one AST.
KEY X	SCR 9615 0 MARP	Defines key number to be used as the monitor key. Make sure that the mnemonic MARP appears by Key 0, the primary directory number (DN) for the phone. The Multiple Appearance DN Redirection Prime (MARP) tells the system which TN (phone) configuration to use for call redirection purposes, for example, where to route a call in a busy situation.

CS 1000 Phone mode configuration example

```
DES  I2050
TN   096 0 02 02  VIRTUAL
TYPE 2050PC
CDEN 8D
CTYP XDLC
CUST 0
NUID
NHTN
CFG_ZONE 08000
CUR_ZONE 08000
MRT
ERL  0
ECL  0
FDN
TGAR 0
LDN  NO
NCOS 0
SGRP 0
RNPG 0
SCI  0
SSU
XLST
SCPW
SFLT NO
CAC_MFC 0
CLS  CTD FBD WTA LPR MTD FND HTD TDD HFA CRPD
     MWD LMPN RMMD SMWD AAD IMD XHD IRD NID OLD VCE DRG1
     POD SLKD CCSD SWA LND CNDD
```

```
     CFTD SFD MRD DDV CNID CDCA MSID DAPA BFED RCBD
     ICDD CDMD LLCN MCTD CLBD AUTU
     GPUD DPUD DNDD CFXD ARHD CLTD ASCD
     CPFA CPTA ABDD CFHD FICD NAID BUZZ AGRD MOAD
     UDI RCC HBTD AHD IPND  DDGA NAMA MIND PRSD NRWD NRCD NROD
     DRDD EXR0
     USMD USRD ULAD CCBD RTDD RBDD RBHD PGND FLXD FTTC DNDY DNO3 MCBN
     FDSD NOVD VOLA VOUD CDMR PRED RECD MCDD T87A SBMD
     KEM3 MSNV FRA  PKCH MUTA MWTD DVLD CROD ELCD
CPND_LANG ENG
HUNT
PLEV 02
PUID
UPWD
DANI NO
AST  00
IAPG 0
AACS YES
ACQ  AS: AST-DN
ASID 35
SFNB  1  2  3  5  6  7  8  9  10  11  12  13  15  16  17  18  19  20  21  22  23
24  25  32  33  34  35  36  37  38  39
SFRB  32  33  34  35  36  37  38  39
USFB  1  2  3  4  5  6  7  8  9  10  11  12  13  14  15
CALB  0  1  2  3  4  5  6  7  8  9  10  11
FCTB
ITNA NO
DGRP
MLWU_LANG 0
MLNG ENG
DNDR 0
KEY  00 SCR 9615 0 MARP
     01
     02
     03 CWT
     04
     05
     06
     07
     08
     09
     10
     11
     12
     13
     14
     15
     16
     17 TRN
     18 AO6
     19 CFW 16  2184
     20 RGA
     21 PRK
     22 RNP
     23
     24 PRS
     25 CHG
     26 CPN
     27
     28
     29
     30
     31
DATE 20 OCT 2011
```

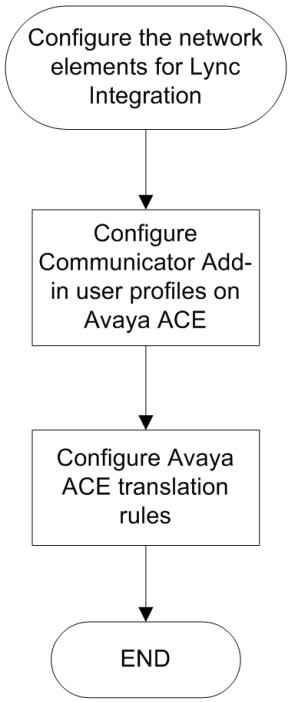
Chapter 10: Configure the network elements for Lync Integration

Prerequisites for Avaya ACE™ 3.0.x and 6.2.1

- The Avaya ACE server must be installed and functional. See *Avaya Agile Communication Environment™ Planning and Installation* (NN10850-004).
- You must have administrator privileges on the Avaya ACE server.
- The service provider must be configured. For information about service provider configuration, see *Avaya Agile Communication Environment™ Administration* (NN10850-005).
- You must be familiar with Avaya ACE user management. For more information, see *Avaya Agile Communication Environment™ Administration* (NN10850-005).
- You must create the Avaya ACE user group **RESTful_Session_Control**.
- The Avaya ACE 6.2.1 server must be installed with Integrated Windows Authentication (IWA) enabled.
- The Avaya ACE 6.2.1 server must be in the same domain as the PC where Lync Integration will be installed.
- Inbound communication must be enabled on the Avaya ACE applications API access port.

Configure the network elements for Lync Integration procedures

This task flow shows the procedures you perform to configure the network elements for Lync Integration.



Configuring Lync Integration user profiles on Avaya ACE™

Avaya ACE maintains a user profile database to manage user information and to authenticate any entity requesting a web service. For information on creating and managing Avaya ACE user profiles, see *Avaya Agile Communication Environment™ User and Security Administration* (NN10850–010).

All Lync Integration users must have an Avaya ACE user profile.

Note:

Lync Integration users must be a member of the Avaya ACE user role **RESTful_Session_Control**.

If an Avaya ACE user belongs to many Active Directory groups, the user may experience issues authenticating user credentials and logging in. The following document describes how to resolve this issue: HTTP://SUPPORT.MICROSOFT.COM/KB/327825.

Table 6: Lync Integration user profile requirements on Avaya ACE

You must add a telephone type contact with the contact identifier matching the E.164 representation of the work number provisioned against the Lync 2010 user. The Contact Name can be any value.

Contact Type	Contact Name	Contact Identifier	Priority	Default CLI
Telephone	work phone	tel:<E.164_work_number>	0.5	No

Configuring Avaya ACE translation rules

The Lync 2010 environment encourages the use of E.164 telephone numbers to be published by Active Directory and Lync Server 2010. In Phone mode, the service provider manages extensions only and is aware of local numbers. ACE must be configured to translate between these numbering formats in the Lync Server 2010 and Communication Manager domains. For more information on address translation, see *Avaya Agile Communication Environment™ Service Provider Administration* (NN10850-005).

Chapter 11: Configure a dial plan

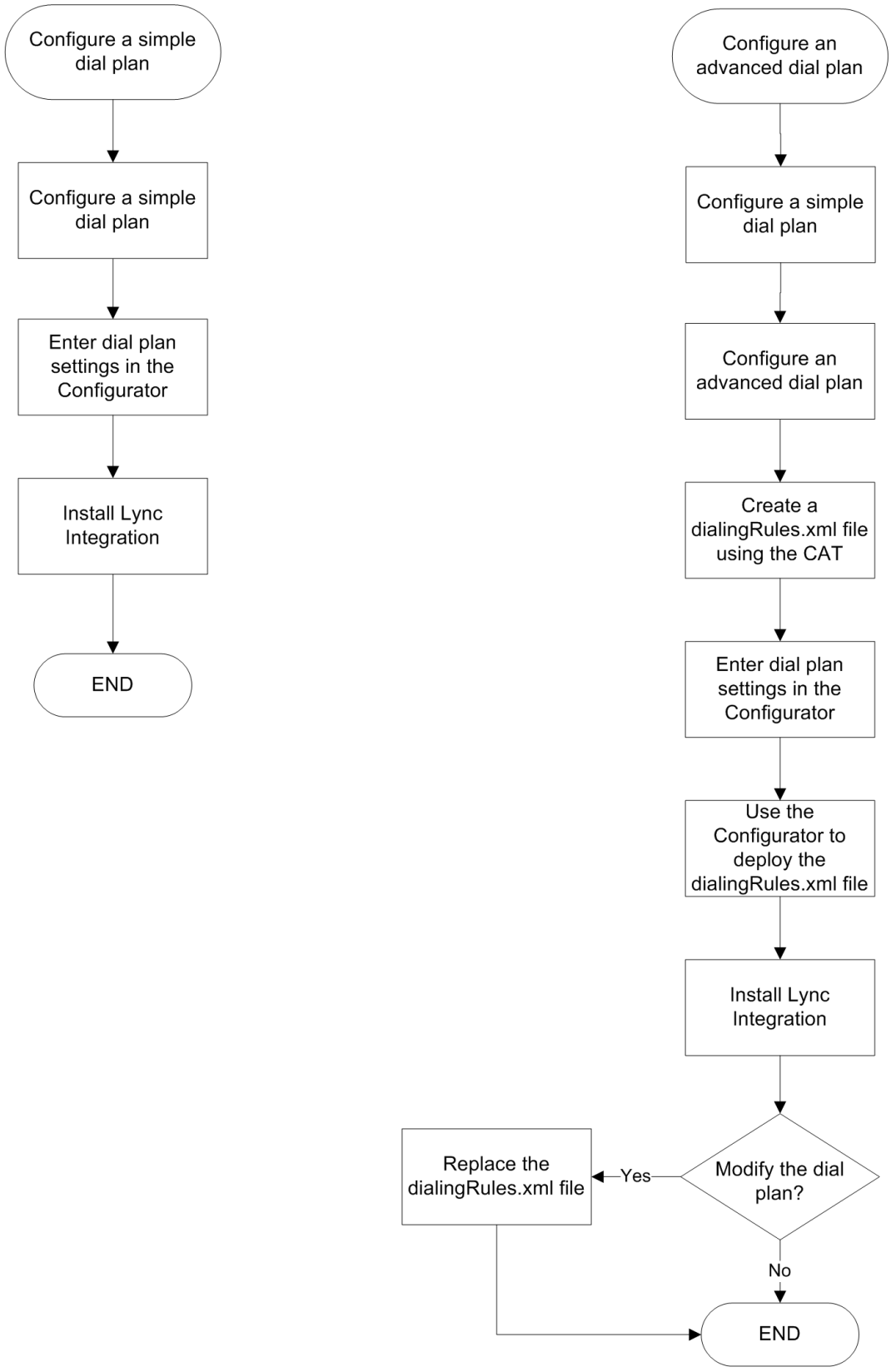
This section applies to Lync Integration deployments using Avaya Aura®. In these scenarios, you must configure a dial plan to enable the telephony features of Avaya Lync Integration. You can configure a simple or advanced dial plan. You create a simple dial plan by configuring the **Dialing Settings** in the Configurator. To create an advanced dial plan, you must configure the **Dialing Settings** in the Configurator and use the Configurator to deploy an `dialingRules.xml` file.

Prerequisites

You must understand the structure of a dial plan. For a description of dial plans, see Dialing rules fundamentals on page 31.

Configure a dial plan procedures

This task flow shows the procedures you perform to configure a dial plan.


Configure a simple dial plan
Configure a simple dial plan
Enter dial plan settings in the Configurator
Install Lync Integration
END
Configure an advanced dial plan
Configure a simple dial plan
Configure an advanced dial plan
Create a dialingRules.xml file using the CAT
Enter dial plan settings in the Configurator
Use the Configurator to deploy the dialingRules.xml file
Install Lync Integration
Modify the dial plan?
Yes
Replace the dialingRules.xml file
No
END

Navigation

- Configuring a simple dial plan on page 63
- Configuring an advanced dial plan on page 65
- Creating a dialingRules.xml file using the Centralized Administration Tool on page 66
- For the procedure that covers entering dial plan settings in the Configurator and using the Configurator to deploy the `dialingRules.xml` file, see Building the install package on page 71
- All the procedures to install Lync Integration are contained in Deploy Lync Integration on the desktop on page 69
- Replacing the dialingRules.xml file on the workstation where Lync Integration is installed on page 79

Configuring a simple dial plan

You can configure a simple dial plan in the Configurator when building the Lync Integration install package. Users can modify the dial plan in the Lync Integration **Settings** window by selecting the **Dialing Rules** tab.

Use the dial plan checklist to create a simple dial plan. The settings are described in Dial plan variables on page 64.

For examples of a simple dial plan, see Simple dial plan examples on page 33

Dial plan checklist

Phone Settings	
IP address of the telephone server or servers	
SIP Domain (Applies only to CS 1000 in Computer or Computer and Phone mode.)	
Dialing Rules Settings	
Enable Call Forward	
Digit(s) you must dial to access an outside line	
Country code	
Area/city code	

PBX Main Prefix	
Digit(s) you must dial to make long-distance calls	
Digit(s) you must dial to make international calls	
Extension length for internal extensions	
Length of national phone numbers (Includes area and city codes)	
Do you have to dial the area/city code when making a local call?	
Extension Settings	
Phone Extension	
Phone Password	

Dial plan variables

Variable	Description
Enable Call Forward	When Call Forward is enabled, the Call Forward icon is displayed.
Number to dial to access an outside line	The digit or digits you must dial to access an outside line.
Your country code	The dialing code for your country.
Your area/city code	The area code or the city code where your phone server is located. You can enter multiple codes separated by commas. For example, 406, 208. In this example, Lync Integration treats all calls made the 406 or 208 regions as local calls.
PBX Main Prefix	The main prefix of your PBX. This is the digit(s) that comes after the area/city code and before the internal extension. If you cannot obtain the extension number by removing digits up to and including the PBX main prefix from an E.164 representation of the number, then this field should remain blank.
Number to dial for long distance calls	The digit or digits you must dial to make a long distance call.
Number to dial for international calls	The digit or digits you must dial to make an international call.

Variable	Description
Extension length for internal extensions calls	The number of digits that comprise an internal extension. For example, if your internal extensions consist of five digits, enter 5. In this example, any number that consists of five digits or less would be treated as an internal extension. If your company supports internal extensions of varying lengths, enter the length numbers separated by comas. For example, if you use three-digit, five-digit, and seven-digit extensions, enter 3, 5, 7. **Note:** If you specify multiple extension lengths, Lync Integration performs exact matches. For example, if you specify 3, 5, 7, then a four-digit number will not be recognized as an internal extension.
Length of national phone numbers (including area/city code)	The number of digits you must dial (including area/city code) for a call within your country.
Include area/city code when making a local call	Check the box if you are required to prefix the area or city code while making a local call.

Configuring an advanced dial plan

In deployments where the simple dialing rules are not enough, you must manipulate incoming and outgoing phone numbers by creating a `dialingRules.xml` file. You can create a `dialingRules.xml` file using the Avaya one-X® Communicator Centralized Administration Tool (CAT) or by using a text editor. For examples of an advanced dial plan, see Advanced dial plan examples on page 37.

Deploy the `dialingRules.xml` using the Configurator. When you are performing the procedure to build the install package using the Configurator, you can specify the `dialingRules.xml` file to be included.

You can make changes to the `dialingRules.xml` file without reinstalling the Lync Integration software. Modify the `dialingRules.xml` using the CAT and deploy the new file using the `updateRules.wsf` tool. Changes to this file will take effect at the next Lync 2010 sign in. See Replacing the dialingRules.xml file on the workstation where Lync Integration is installed on page 79.

Creating a dialingRules.xml file using the Centralized Administration Tool

You can create or modify a `dialingRules.xml` file using a text editor or by using the Avaya one-X® Communicator Centralized Administration Tool (CAT). The CAT is distributed with the Avaya one-X Communicator. Download the Avaya one-X Communicator Admin Tool R6.1 SP2 or higher.

This document provides the procedures for working with a `dialingRules.xml` file. See the Avaya one-X Communicator Centralized Administration Tool documentation for further details. When creating dialing rules in CAT, only use the **Dialing Rules** tab. The remaining tabs are not used.

Dialing rules interface

Add

Click this button to open the **Add Rule** dialog box.

Add Rule window

Use this window to specify a pattern match rule.

Field	Description
Pattern	Field to enter a regular expression. The pattern can exist anywhere in the input string, not necessarily from the beginning or the end of the input string.
Type	List box to specify whether to apply the **Dialable** rule to all the outgoing numbers before storing the number in the call log or to apply the **Normalize** rule to all the incoming numbers before storing the number in the call log. Specify **0** for Dialable or **1** for Normalize.
Prefix	Field to enter the string to be prefixed to the input string after deleting the specified number of characters.
Delete Length	Field to enter the number of characters, including the + character, to delete from the beginning of the input string.
Minimum Length	Field to enter the minimum length, including the + character, of the input string.
Maximum Length	Field to enter the maximum length, including the + character, of the input string.
OK	Button to add the pattern match rule and close the **Add Rule** dialog box.

Field	Description
Cancel	Button to cancel adding the pattern match rule and close the **Add Rule** dialog box.

Remove

Click this button to remove an existing pattern match rule.

Save

Click this button to save the Avaya one-X Communicator dialing rules settings.

Open

Click this button to open the existing `dialingRules.xml` file.

Configuring dialing rules

Use the **Dialing Rules** tab to configure dialing rules.

Procedure

1. Click the **Dialing Rules** tab.
2. Click **Add** to open the Add Rule dialog box.
3. Enter the appropriate information.
4. Click **OK** to add a new pattern match rule.
5. Click **Save** to save the Dialing Rules settings.

Modifying dialing rules

Use the **Dialing Rules** tab to modify the existing dialing rules settings.

Procedure

1. Click the **Dialing Rules** tab.
2. Click **Open**.
3. Select the `dialingRules.xml` file.
4. If you want to add additional pattern match rules, click **Add** to open the Add Rule dialog box, enter the appropriate information, and click **OK**.
5. If you want to remove a pattern match rule, select a rule and click **Remove**.
6. Click **Save** to update the dialing rules settings.

Chapter 12: Deploy Lync Integration on the desktop

Prerequisites

The machine where Lync Integration is installed must meet the following requirements:

Table 7: Hardware requirements

Processor	1.8 GHz
Memory	1 GB (Windows XP) 2 GB (Windows 7)
Disk space	100 MB
Audio device	An audio device must be available on the computer to use Lync Integration in Computer mode.
Connectivity	Download bandwidth: 80 kbps Upload bandwidth: 80 kbps

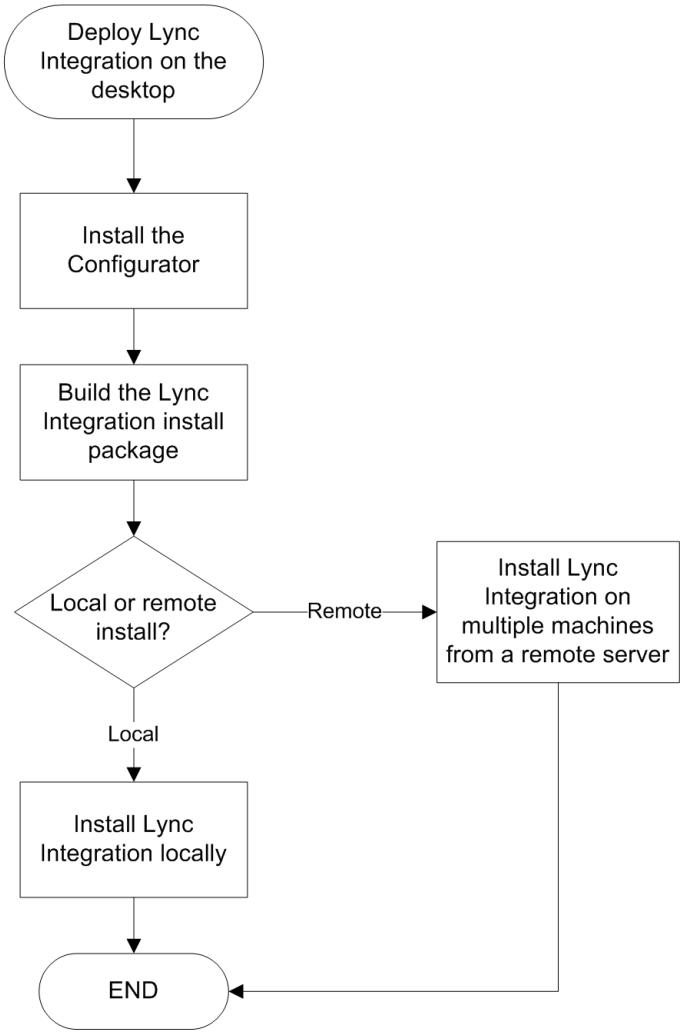
Table 8: Software requirements

Operating system	Microsoft Windows XP Service Pack 3, or higher Microsoft Windows 7
Microsoft .Net	For Lync, release 4.0 or higher. For Office Communicator, release 3.5, 4.0, or higher.
Microsoft Lync 2010 or Microsoft Communicator	Microsoft Lync 2010 version 4.0.7577.4103 or higher
	Microsoft Office Communicator 2007 R2, version 3.5.6907.253 or higher

Deploy Lync Integration on the desktop procedures

This task flow shows the procedures you perform to deploy Lync Integration on the desktop.

This task flow applies to a first time installation of Lync Integration. If you previously installed Lync Integration and are upgrading to a new version, see Upgrade Lync Integration on page 107



Navigation

- Installing the Configurator on page 71
- Building the install package on page 71
- Installing Lync Integration locally on page 74
- Installing the Lync Integration on multiple machines from a remote server on page 76

Installing the Configurator

Install the Avaya DCE Configurator. The Configurator is an administrative tool used to configure and build the install packages for the Lync and Communicator Add-in applications prior to distribution of the add-ins to end users.

Before you begin

- You are running one of the following operating systems:
  - Microsoft Windows XP SP3
  - Microsoft Windows 7
- You have Microsoft .NET Framework 4.
- The machine where you are installing the Configurator must be able to communicate with the Avaya ACE server.
- You have the DCE.configurator.msi file on your desktop. The Configurator installation package is available on the Avaya ACE Applications disk in the Desktop Communications Enablement (DCE) folder.

Procedure

1. Double-click the DCE.Configurator.msi file to launch the Windows installer for the Avaya DCE Configurator.
2. When the Avaya DCE Configurator installer opens, click **Next**.
3. When the Avaya DCE Configurator setup wizard opens, click **Next**.
4. In the License Agreement window, click **I Agree** to accept the license agreement.
5. In the Select Installation Folder window, specify a path to the installation folder for the Avaya DCE Configurator and click **Next**.
6. In the Confirm Installation window, click **Next** to start the installation.
7. In the Installation Complete window, click **Close** to exit the setup wizard.
   The Avaya DCE Configurator icon appears on your desktop.

Building the install package

Build the install package for Avaya Lync Integration or Avaya Communicator Add-in.

Lync Integration can integrate with the Avaya DCE Web Browser Add-in and the Avaya DCE Office Add-in applications to provide a unified user experience across all Avaya DCE desktop

applications. For more information, see *Avaya Configurator for Desktop Communication Enablement Fundamentals* (NN10850–031).

The Configurator builds the following files:

- `LyncIntegration.zip` — The Lync Integration software.
- `MCAddin.zip` — The Communicator Add-in software.

These files must be transferred to the machine where the Communicator Add-in is installed.

Before you begin

- You have installed the Avaya DCE Configurator.
- You know the host URL for the Avaya ACE server that is hosting the application. The URL must:
  - be prefixed with `https://`
  - contain the Avaya ACE server fully qualified domain name
  - end with a port number

  For example, `https://hostname.avaya.com:443`.
- You must be able to define the following configuration variables:

Variable	Description
General Settings	
Communication System Type	The options are: • **Avaya Aura** • **CS 1000 with ACE** • **CS 1000 Collaboration Pack**
Integration Type	For Avaya Aura and CS 1000, the options are: • **Computer Only** • **Phone Only** • **Computer & Phone** For CS 1000 Collaboration Pack, the available option is: • **Computer Only**
Preferred Integration Type	This variable is enabled if the **Integration Type** is **Computer & Phone**. You can select which one of the two modes is presented to the user when they start the client.
Server List	**CS 1000:** A comma separated list of call servers. Each server must have a transport type appended. For example `cs1000.company.com;transport=udp`.

Variable	Description
	Important: Do not add call servers that are not applicable to the extension. The Lync Integration client may continue to search the call server list and become unresponsive.
SIP Domain	**CS 1000:** The SIP domain of the users.
Dialing Settings	
See Configure a dial plan on page 61 If you are configuring an advanced dialing plan and will be deploying a `dialingRules.xml` file, you must know the location of the file.	
Additional Settings (For CS 1000 deployments if the **Integration Type** is **Computer** or **Computer & Phone**).	
Enable iSAC	Enables iSAC codec.
Super-wideband support	Enables super-wideband support for iSAC codec.
Enable G.722	Enables G.722 codec.
Enable G.729	Enables G.729.
Annex B support	Enables Annex B support for G.729 codec
Enable G.711 A-law	Enables G.711 A-law codec. Cannot be deselected.
Enable G.711 Mu-law	Enables G.711 A-law codec. Cannot be deselected.
Enable Comfort Noise	Enables Comfort Noise.
Enable SRTP	Enables Secure Real-Time Transport Protocol.
Cipher 1, Cipher 2	Ciphers to be negotiated when secure RTP is used. Cipher 2 can set only after Cipher 1.

Note:

The **Video Settings** tab is not applicable for standard CS 1000 deployments. Video settings can only be configured for Avaya Aura® and CS 1000 Collaboration Pack deployments.

Procedure

1. Double-click the Avaya DCE Configurator icon to open the Avaya DCE Configurator tool.
2. Read the information in the **Welcome** screen, and then click **Next**.
3. In the **Client Deployment** screen, select **Microsoft Lync/ Communicator Client**.

4. In the **Microsoft Lync/ Communicator Installers** screen, select **Build Lync Integration Installer**, **Build Communicator Add-in Installer**, or both. Then click **Next**.
5. In the **Microsoft Lync/ Communicator Settings** screen, click **Change**.
6. In the Lync Integration Settings window, click the **General Settings** tab and enter the configuration details for your deployment.
7. Click the **Dialing Settings** tab and enter the details for your deployment.
8. If you are deploying a `dialingRules.xml` file, click the **Specify Dialling Rules XML File** check box under the **Dialing Settings** tab, and then click on the folder icon. Navigate to the file location and click **Open**.
9. If required, under the **Additional Settings** and **Video Settings** tabs, specify the settings that you want to use.
10. Click **OK** to return to the Configurator wizard.
11. In the **Microsoft Lync/ Communicator Settings** screen, click **Next**.
12. Follow the instructions in the Configurator wizard to finish configuring the installation packages. For more information, see **Configuring the installation packages for the DCE applications with Lync Integration** in *Avaya Configurator for Desktop Communication Enablement Fundamentals* (NN10850–031).
13. When you are ready to build the installation packages, in the Configurator wizard's **Build** screen, select the destination folder for the output and then click **Build**.
14. From the Avaya Client Applications folder, unzip the Lync Integration and Communicator Add-in files, and extract the `.msi` file.

Installing Lync Integration locally

Use this procedure to install Avaya Lync Integration where the installation software is local to the machine where it is being installed. The Lync Integration is installed on end user machines coresident with Lync 2010.

When using this procedure to install Lync Integration, no installation log file is created. If you experience problems with installation, perform the installation from the command line and view

the log file. See Installing the Lync Integration on multiple machines from a remote server on page 76.

Before you begin

- You must have administrative privileges on the local desktop.
- You must have the Lync Integration `.msi` file. Extract the `.msi` file from the `.zip` file created by the Configurator.
- The Microsoft Lync 2010 client must be installed before Avaya Lync Integration is installed.
- The Microsoft Communicator client must be installed before Avaya Communicator Add-in is installed.

About this task

The log and support directories can be found in the `APPDATA` system property.

Procedure

1. If open, exit Microsoft Lync 2010.
2. If open, exit Internet Explorer.
3. Open the Windows Explorer tool and navigate to the location of the Lync Integration `.zip` file.
4. Unzip the file.
5. Perform one of the following options.
   - If you are installing Lync Integration:
     - Double click on the Microsoft Lync 2010 SDK installation file `LyncSdkRedist-4.0.7577.124.msi` and follow the instructions to complete the installation.
     - Double click on the Lync Integration installation file `LyncIntegration-<release#>.msi` and follow the instructions to complete the installation.
   - If you are installing Communicator Add-in, double click on the Communicator Add-in installation file `MCAdd-in-<release#>.msi` and follow the instructions to complete the installation.

   You may receive a prompt to restart the system. If this occurs, you must reboot the machine to complete the installation.
6. Perform one of the following options.
   - If you installed Lync Integration:
     - Start Lync 2010.
     - Start Lync Integration. On Lync 2010, select **Tools** > **Avaya Microsoft Lync Integration**.

Note:

You only need to start Lync Integration after the initial installation. For subsequent Lync 2010 startups, Lync Integration also starts.

- If you installed Communicator Add-in, start Office Communicator.

7. On some deployments, the Lync Integration Settings window opens with the **Phone** tab displayed. Enter your **Extension** number and the **Password** for your extension.

Installing the Lync Integration on multiple machines from a remote server

To facilitate the integration of the Avaya Lync Integration software into bulk software distribution and installation infrastructure, the Lync Integration software can be installed without end-user intervention, using the following command:

```
msiexec /i [LyncIntegration | MCAddin]-<release#>.msi
REBOOT=ReallySuppress /L*v [LyncIntegration | MCAddin].install.log /q
```

Installation notes

- The Microsoft Lync 2010 client must be installed before Avaya Lync Integration is installed.
- The Microsoft Communicator client must be installed before Avaya Communicator Add-in is installed.
- You must have the Lync Integration `.msi` file. Extract the `.msi` file from the `.zip` file created by the Configurator.
- The `/q` parameter kills running Lync 2010 client, Lync Integration, and one-X engine processes. The installation cannot proceed if the Microsoft Lync Client is running.
- You may receive a prompt to restart the system. If this occurs, you must reboot the machine to complete the installation.
- Any interaction with the Microsoft Lync Client or Microsoft Communicator by an end user during the installation can result in a failed installation. The `[LyncIntegration | MCAddin].install.log` will indicate the operation is complete. Please allow enough time for completion of the operation prior to re-starting the Lync 2010 client (up to 1 minute,

for slower machines). Failure to do so will result in an unsuccessful installation and the installation process must be repeated.

- You must have administrator privileges to install the application. On Windows 7, you must open the Command Prompt window using the **Run as administrator** option. To run the Command Prompt as administrator:

    a. From the Windows start menu, type **`Command Prompt`** in the **Search programs and files** box.

    The Command Prompt application is displayed in the list under **Programs**.

    b. Right click on **Command Prompt** and select **Run as administrator**.

Lync Integration will start the next time Microsoft Lync 2010 is started after logging into Windows. To start Lync Integration without restarting Windows, from the Lync 2010 **Tools** menu, select **Avaya Microsoft Lync Integration**.

To validate the installation, view the log file `LyncIntegration.install.log` or `MCAddin.install.log`. The file contains text readable output of the installation process and indicates successful install of Lync Integration.

Chapter 13: Replacing the dialingRules.xml file on the workstation where Lync Integration is installed

There are two ways of replacing the `dialingRules.xml` file used.

- Build a new Lync Integration installer including the updated file and then follow the procedures to uninstall and reinstall Lync Integration.
- Use the `updateRules.wsf` script to update the `dialingRules.xml` file on a workstation where Lync Integration is installed. This script is intended to be used in conjunction with a company's preferred workstation software deployment method; for example, run as a Microsoft SMS deployed script.

Before you begin

- You must have an updated `dialingRules.xml` file. See Modifying dialing rules on page 67
- You must be able to run the `updateRules.wsf` script with Administrative privileges.

Note:

If the new dial plan rules are not applied after a Lync 2010 client restart, reboot the workstation to ensure that the Lync Integration process has been restarted.

Procedure

1. On the machine where Lync Integration is installed, open a command prompt window.
2. Navigate to the location of the `updateRules.wsf` tool. The tool is located in the `ProgramFiles` system property under the **Avaya one-X Communicator for MSI** folder.
3. Run the tool. Enter

   ```
   cscript updateRules.wsf /?
   ```

   Details on how to replace the `dialingRules.xml` file are displayed.
4. Once the new file is deployed, log out and log back in to the Lync 2010 client to apply the changes.

Replacing the dialingRules.xml file on the workstation where Lync Integration is installed

Chapter 14: Troubleshooting Lync Integration

Use the information in this chapter to help troubleshoot issues related to Lync Integration configuration.

For the most detailed log information, run Lync Integration in debug mode. Click to open the Settings window and then select the **Support** tab.

For additional troubleshooting information, see *Avaya one-X® Communicator Troubleshooting* (16-603218).

Add-in disappears when Conversation window is maximized

User Alert

The Avaya Lync Integration add-in disappears when users click the icon to maximize the Conversation window. Users cannot control calls with Lync Integration.

Logs/Alarms

None.

Root Cause

Microsoft takes control of the screen when windows are maximized in the Lync client.

Recovery Action

Minimize the Conversation window. Expand the window by stretching it manually.

Application crashes

User alert

Lync Integration suddenly stops working and shuts down.

Logs/Alarms

No Lync Integration logs for this issue.

The following error alert appears under **Control Panel** > **Administrative Tools** > **Event Viewer** > **Applications and Services Logs**: `Faulting application name: LyncAddin.exe, version 1.0.0.0, time stamp: 0x12345678 Faulting module name: ntdll.dll, version 6.1.7601.17725, time stamp 0x12345678 Exception code: 0xc0000005….`

Root Cause

Incompatible software is installed on the work station.

Recovery Action

Do the following:

1. Perform the Clean Boot operation to determine the issue. For more information, see http://support.microsoft.com/kb/929135.
2. Uninstall and re-install Lync Integration to make sure the issue is resolved.

Application does not launch

User Alert

Lync Integration does not launch when signing into Lync Client 2010, and the Lync 2010 **Tools** menu does not contain the Avaya Lync Integration menu item.

Logs/Alarms

None.

Root Cause

Lync Integration application was not installed successfully.

Recovery Action

Examine Lync Integration installation log, rectify the failing condition, and repeat the installation. Microsoft Installer (MSI) error codes can be found here: http://support.microsoft.com/kb/229683 .

Application does not launch (CS 1000)

User Alert:

Adapter failed to initialize.

Logs/Alarms:

Unsupported user Identity: Administrator.

Root Cause:

Clients that use the REST adapter (CS 1000 phone mode) cannot run the Lync Integration application when logged in as the administrator user ID.

Recovery Action:

Log in to the client machine with a user ID other than administrator.

AIE cannot register for phone events from ACE – Deprecated in R 6.2.2

User Alert:

Server or connection to the server is down. Reason Unknown. Please contact administrator and sign in again

Logs/Alarms:

2011-02-24 15:30:45.171 1 Debug QueryLine Exeception: Object reference not set to an instance of an object

?Object reference not set to an instance of an object.

at RestProvider.RestProvider.QueryLine(String line)

at RestProvider.RestProvider.InitialQueryLine()

Root Cause:

The Application Integration Engine (AIE) is not able to use the Call Notification web service.

Recovery Action:

Check the Avaya ACE logs. Specifically, look at:

- appcoredebug
- service provider logs

AIE is not aware of the phone number Lync Integration is registered for – Deprecated in R 6.2.2

User Alert:

User was not provisioned properly. Please contact your administrator

Logs/Alarms:

2011-05-16 10:06:14.513 1 Debug InitialQueryLine - QueryLine WebException: The remote server returned an error: (404) Not Found.

?The remote server returned an error: (404) Not Found.

at System.Net.HttpWebRequest.GetResponse()

at RestProvider.RestProvider.SendHTTPWebRequest(String method, String connectionUri, Int32 timeout, String payload)

at RestProvider.RestProvider.QueryLine(String line)

at RestProvider.RestProvider.InitialQueryLine()

Root Cause:

The Lync Integration phone number does not match the phone number in the Avaya ACE user profile.

Recovery Action:

- Check the Avaya ACE user profile contacts against phone number provisioned on Lync Integration (the Lync Integration phone number could be provisioned on the local machine or in Active Directory).
- If you change the contact number in the Avaya ACE user profile, wait 4 minutes for the AIE to synchronize new user profile data from Avaya ACE.
- If the numbers in the Avaya ACE user profile and the Avaya Lync Integration are the same, restart the AIE.

Note:

It may take 5 mins for the `startcallnotification` to pickup configuration changes after the restart.

AIE not responding to query line request from Avaya Lync Integration – Deprecated in R 6.2.2

User Alert:

Server or connection to the server is down. Please contact your administrator

Logs/Alarms:

2011-03-01 15:52:11.114 1 Debug QueryLine WebExeception: Unable to connect to the remote server

?Unable to connect to the remote server

at System.Net.HttpWebRequest.GetResponse()

at RestProvider.RestProvider.QueryLine(String line)

at RestProvider.RestProvider.InitialQueryLine()

2011-03-01 15:52:11.114 1 RestProvider.ShowErrorMsgDialog Server or connection to the server is down.

Please contact your administrator

Root Cause:

No network connectivity between the Lync Integration machine and the Application Integration Engine (AIE).

Recovery Action:

- Use the **`ping`** command to ensure that the AIE is reachable.
- Check AIE port configuration and the procedures for configuring securing communication with the AIE. See *Avaya Agile Communication Environment Application Integration Engine Fundamentals* (NN10850–021).

AIE returns 401 unauthorized error – Deprecated in R 6.2.2

User Alert:

Server or connection to the server is down. Please contact your administrator

Logs/Alarms:

2011-05-16 14:07:08.275 1 Debug InitialQueryLine - QueryLine WebException: The remote server returned an error: (401) Unauthorized.

?The remote server returned an error: (401) Unauthorized.

at System.Net.HttpWebRequest.GetResponse()

at RestProvider.RestProvider.SendHTTPWebRequest(String method, String connectionUri, Int32 timeout, String payload)

at RestProvider.RestProvider.QueryLine(String line)

at RestProvider.RestProvider.InitialQueryLine()

Root Cause:

The Application Integration Engine (AIE) is installed with Integrated Windows Authentication enabled and the Lync Integration machine is not in the same domain as the AIE.

Recovery Action:

- Ensure that the AIE and the Lync Integration machine are in the same domain.
- When in phone mode, RESTful URLs are written to the Lync Integration log file. Enter the RESTful URL into a browser on the Lync Integration machine. If you receive a prompt for a user name and password, this indicates that the Integrated Windows Authentication is not functioning and the AIE and the Lync Integration machine are not in the same domain.

Avaya Lync Integration can initiate phone calls but call control window remains in calling state for one minute

User Alert

No user alert displayed.

Logs/Alarms

No log exceptions – QueryConnection Response missing connection state details.

Root Cause

Ports for the Trusted Redirector are blocked preventing call notifications from reaching the ACE server and the Lync client. Calls are established, but the Call Control window fails to update until the `getConfirmation` request is sent to the ACE server.

Polling occurs at 60 second intervals. The Hold Call and DTMF functions should be displayed as soon as the called party answers the call.

Recovery Action

- Check the following Avaya ACE logs:
  - `appcoredebug`
  - service provider logs
- Check IIS Manager — ACE Trusted Redirector — HTTP ports
- Check ACE port configuration and the procedures for configuring securing communication with the ACE. See *Avaya Agile Communication Environment™ Planning and Installation* (NN10850–004).

Different behaviors for calls made from the right-click menu and from the green phone icon

User Alert

When a Lync Integration user makes a call by right-clicking on a contact and selecting **Make Voice Call**, the call fails. When the user makes the call by clicking on the green phone icon, the call is successful.

Logs/Alarms

The following example shows the type of information in the Lync Integration log file when the user makes a call by right-clicking on the contact and selecting **Make Voice Call**. For the most detailed log information, run Lync Integration in debug mode.

```
2012-09-06 12:13:18.499 10 Debug DiallingRules: NormalizeUri: incoming number 8672
to +75557778672 using default implementation
2012-09-06 12:13:18.499 10 Debug LyncClientManager: GetNativeContact for uri tel:
+75557778672
2012-09-06 12:13:18.604 10 Debug DiallingRules: GetTranformedString: matched rule:
+75557778672
2012-09-06 12:13:18.605 10 Debug DiallingRules: NormalizeUri: incoming number
+75557778672 to +85557778672 using pattern match
```

Root Cause

The normalized phone number is re-normalized a second time into a different phone number. For example:

- The default implementation normalizes `8672` to `+75557778672`.
- Pattern match then normalizes `+75557778672` to `+85557778672`.

The number resulting from the first normalization operation should not be re-normalized. All numbers must be completely normalized by the first normalization operation.

Recovery Action

Remove the second normalization operation, and add another normalization rule to convert the first number format into the final form. From the example above, the new normalization rule must convert `8672` to `+85557778672`.

Enabling debug when Lync Integration is not starting

User Alert

The user cannot get Lync Integration running, and you require more logs and debug information to resolve the issue.

Logs/Alarms

You must enable debug mode.

Root Cause

Unknown.

Recovery Action

1. Uninstall Lync Integration.
2. Reinstall Lync Integration using the following command line parameter:
   ```
   msiexec /i LyncIntegrationCS1K-6.2.0-SNAPSHOT.msi DEBUG=true
   ```
3. Restart Lync Integration.

G729 or G722 Codec negotiation fails

User Alert:

No User Alert Displayed

Logs/Alarms:

No log exceptions. QueryConnection Response missing connection state details.

Root Cause:

One or more endpoints or media elements has codecs disabled.

Recovery Action:

- Verify the G729 and G722 codecs are enabled on Communication Manager.
- Verify that the following four lines exist in the Lync Integration `config.xml` file :

```
<parameter>
<name>EnableG729</name>
<value>1</value>
</parameter>
```

The `config.xml` file can be found in the `APPDATA` system property under the **Avaya one-X Communicator for MSI** folder.

Incorrect Internet Explorer ActiveX Policy Settings

This troubleshooting issue has been deprecated and does not apply to the current release.

User Alert:

- ERROR: The Avaya Communicator Add-in cannot access ActiveX. Insufficient security permissions. Please contact your administrator.
- Internet Explorer Script Error

Logs/Alarms:

None.

Root Cause:

Communicator Add-in unsuccessfully tries to use ActiveX API.

Recovery Action:

Review ActiveX Internet Explorer browser settings for the client machine and the Active Directory group policy settings.

Install or uninstall failure: script could not be run

User Alert:

There is a problem with the Windows Installer package. A script required for this install to complete could not be run. Contact your support personnel or package vendor.

Logs/Alarms:

The Windows Installer log, if enabled, contains the following log entry.

```
Action start xx:xx:xx: stopOneXClientsForUninstaller.
MSI (s) (B0:04) [xx:xx:xx:xxx]: Product: Avaya MC Add-in – Error 1720. There is a
problem with this Windows Installer package. A script required for this install to
complete could not be run. Contact your support personnel or package vendor. Custom
action stopOneXClientsForUninstaller script error -2147217406, : Line 111, Column
15,
Scripting access to WMI is not working.
```

Root Cause:

The Windows Management Instrumentation (WMI) repository is corrupt.

Recovery Action:

Perform the following steps to complete the install or uninstall of Lync Integration. Note that this procedure may not resolve the underlying Windows operating system issue.

1. Open a command prompt window. Choose one of the following.
   - On Windows XP, from the Windows **Start** menu, select **Run**.

- On Windows 7, you must open an elevated command prompt window. From the Windows **Start** menu, select **All Programs**, then **Accessories**, then right click **Command Prompt**, and select **Run as Administrator**.

2. Type in the following command and press Enter.

   ```
   net stop winmgmt
   ```

3. Open a Windows Explorer window and navigate to the folder `C:\Windows\System32\Wbem\Repository`.
4. Rename the `Repository` folder.
5. Return to the command prompt window and type in the following command and press Enter.

   ```
   net start winmgmt
   ```

6. Type in the following command and press Enter.

   ```
   EXIT
   ```

Invalid phone number format: published phone number does not appear to My Contacts

User Alert:

The Microsoft Lync Communicator presents the following warning: “This number is not a valid phone number. Check the number and try again.”

Logs/Alarms:

None.

Root Cause:

The telephone number is not a valid phone number. Only direct inward dial numbers are supported with the solution.

Recovery Action:

Phone numbers must use a Microsoft supported phone number format. See the Microsoft Lync 2010 documentation for information on supported formats. The following is a link to an online document: Set Phones options and numbers.

Lync Call Control window is not presented when making a call with the desk phone

User Alert

When using the deskphone to place outgoing calls, a call alert notification and the Call Control window are not displayed on the user's computer.

Logs/Alarms

The phoneContext in the logs is listed as UnknownUnknown.

Root Cause

This issue is caused by a corruption in the user's Call Notification Subscription.

Recovery Action

Restart ACE software components and the issue should be rectified in the Lync Add-in within 2 to 30 minutes depending on the number of users on the system.

Lync Integration can initiate phone calls but incoming call and conversation dialogue windows do not automatically close

User Alert:

No User Alert Displayed

Logs/Alarms:

No log exceptions

Root Cause:

Missing or incorrect reverse dial rules for the Avaya ACE service provider.

Recovery Action:

- Check the Avaya ACE logs. Specifically, look at:
  - appcoredebug

- service provider logs

- Confirm that the DN received by Avaya ACE in the service provider logs is properly mapped to the appropriate phone number format (for example, E.164).
- Use the Avaya ACE rule validation tool for Call Notfication v3.8 to confirm that the number format is transformed correctly.

Lync Integration cannot connect to Servers in Phone Mode (Shared Control) or Computer Mode

User Alert:

Server or connection to the server is down. Please contact your administrator.

The following message displays in the Configure Settings Window on the client: Communication servers are not available. Please contact your administrator.

Logs/Alarms:

2011-06-23 15:19:26.341 1 Debug PopupManager.ShowErrorMsgDialog: The selected mode cannot be accessed without configuring login settings.

Do you wish to exit the Lync Integration? Select **Yes** to exit the Lync Integration. To restart the Lync Integration, please sign-out and sign-in to the OCS Communicator. 2011-06-23 15:19:27.825 1 Debug PopupManager.ShowErrorMsgDialog: The selected mode cannot be accessed without configuring login settings.

Do you wish to exit the Lync Integration? Select **Yes** to exit the Lync Integration. To restart Lync Integration, please sign-out and sign-in to the OCS Communicator.

Root Cause:

No network connectivity between user's Lync Integration machine and Communication Manager.

Recovery Action:

- Use the ping command to ensure that the Communication Manager or Call Server is reachable. This may require establishing the VPN tunnel to the enterprise network.
- Check that Communication Manager is functioning and has no alarms.

Lync Integration Communicator Bar does not appear

User Alert:

No user alert displayed.

Logs/Alarms:

No Lync Integration logs.

Root Cause:

The Lync Integration process is not running because:

- The process was not started after a local install.
- The process has exited.

Recovery Action:

Start Lync Integration. From the Lync 2010 **Tools** menu, select **Avaya Microsoft Lync Integration**.

Lync Integration may disable PC

Lync Integration may disable the computer on which it is running. The computer displays a blue screen and is not responsive.

User Alert:

No user alert displayed.

Logs/Alarms:

No Lync Integration logs.

Root Cause:

The problem occurs because the computer graphics driver is not up to date and is conflicting with a Microsoft security update. The problem can be avoided by ensuring that the current graphics driver is installed.

Recovery Action:

1. Remove Security Update MS11-011 KB2393802.
2. Update graphics display driver to the latest manufacturer recommended version.
3. Reinstall the MS11-011 KB2393802 security patch.

If the workaround described above is not successful, do the following:

1. Restore a system update to a snapshot before installing the MS11-011 KB2393802 security patch.
2. Update graphics display driver to the latest manufacturer recommended version.
3. Reinstall the MS11-011 KB2393802 security patch.

Lync Integration timed out from Query line request to Application Integration Engine (server or connection to the server is down) – Deprecated in R 6.2.2

User Alert:

Server or connection to the server is down. Please contact your administrator.

Logs/Alarms:

2011-02-22 16:10:09.734 1 Debug QueryLine WebExeception: The operation has timed out

?The operation has timed out

at System.Net.HttpWebRequest.GetResponse()

at RestProvider.RestProvider.QueryLine(String line)

at RestProvider.RestProvider.InitialQueryLine()

Root Cause:

No network connectivity between the Lync Integration machine and the Application Integration Engine (AIE).

Recovery Action:

- Use the **`ping`** command to ensure that the AIE is reachable.
- Check AIE port configuration and the procedures for configuring securing communication with the AIE. See *Avaya Agile Communication Environment™ Application Integration Engine Fundamentals* (NN10850–021).

Lync Integration icons do not appear on the Microsoft Office Communicator

User Alert:

No User Alert Displayed

Logs/Alarms:

No Lync Integration logs.

Root Cause:

Lync Integration has not launched on the Microsoft Office Communicator program.

Recovery Action:

- Sign out of Office Communicator and then sign back in.
- Review the Active Directory group policy settings.

Lync Integration Share Now window is displayed instead of Conversation window

User Alert

When making a call, a Share Now window appears instead of the Conversation window.

Logs/Alarms

None.

Root Cause

The issue is caused by a misconfiguration of the dialing rules.

Recovery Action

The dialing rules must be corrected.

- Users must update the dialing rules in Lync Integration by selecting the **Dialing Rules** tab in the Lync Integration **Settings** panel.
- If the issue still persists, you must update the dialingRules.xml file using the Avaya one-X® Communicator Centralized Administration Tool (CAT) or a text editor

See Dialing rules fundamentals on page 31 for more information.

Making a call displays Call number is not defined dialog

User Alert

When making a call, the **Call number is not defined** dialog is displayed.

Logs/Alarms

None.

Root Cause

The dialing rules are not configured correctly.

Dialing rules should be defined so that the result of the normalization rule is the end result. The number should not be re-normalized to another number. If a normalized number is passed through dialable translations, the number should also be normalized back to the same form that it was in before the dialable translation.

Below is an example of an entry in the `dialingRules.xml` file that normalizes the number `3509` to `19876543210`.

```
<DialingRulesPattern>
<type>1<type>
<pattern>^3509</pattern>
<subString>19876543210</subString>
<minLength>4</minLength>
<maxlegnth>4</maxLength>
<deleteLength>4</deleteLength>
</DialingRulesPattern>
```

With this example setup if a number is entered as `3509` it will first be normalized to `19876543210` using the dialingRules.xml file. This number can then be passed through the dialable rules before being sent to the call server. If the information in the simple dialing rules does not correspond with the normalized number; for example, if the number is longer than the national phone number length or if the area/city code in the simple dialing rules is different from the caller's number, then the number will be dialed unchanged as `19876543210` when it is passed through the dialable rules. If this number is normalized again, it will be discovered as an E.164 number (`+19876543210`) with the simple dialing rules. The E.164 number resulting from the re-normalization does not match the result of the initial normalization, so the dialing rules are incorrect.

Recovery Action

To fix the issue described above, perform one of the following actions.

- Make sure that the normalized number cannot be normalized again by making sure that the initial normalization converts the number to the E.164 form. To normalize the number in the example scenario above to the E.164 form, you must change the `subString` field in the dialingRules.xml file to:

  ```
  <subString>+19876543210</subString>
  ```

- Make sure that the normalized number cannot be normalized again to a different number by adding a second rule to stop the simple dialing rules from affecting the normalized number.

  After the example scenario above, you could add a rule to normalize the number `19876543210` to `19876543210`, and to override the simple dialing rule normalization of `19876543210` to `+19876543210`.

No microphone sound in computer mode

User Alert:

No User Alert Displayed.

Logs/Alarms:

No log exceptions.

Root Cause:

Using a configured 6.0 version of One-X while installing a 3.0 Lync Integration may set the microphone to zero without any way to adjust the volume.

Recovery Action:

1. Exit Communicator.
2. Run the Audio Tuning Wizard from the **Settings** menu in the 6.0 version of One-X.
3. Sign in to Communicator.
4. Ensure that the correct microphone is selected in the Lync Integration Settings window.

Presence state flickers when the user is on a call

User Alert

The user's presence constantly switches from **Busy — In a Call** to another presence state while the user is on an active call.

Logs/Alarms

None.

Root Cause

In the Custom Presence definition file, another presence state has the same ID number as the **Busy — In a Call** state. As a result, when the user is on a call, the **Busy — In a Call** state is constantly overridden by another presence state.

Recovery Action

In the Custom Presence definition file, Lync Integration uses the ID number 1 for the **Busy — In a Call** state. Make sure all other presence states have a different ID number assigned to them.

Privacy settings block contact display: published phone number does not appear to My Contacts

User Alert:

When the user selects a contact and opens the Lync Integration contact card, or uses the **Make Voice Call** or **Make Video Call** buttons from the Lync Integration Conversation Bar, the user is presented with a “No call options available” message.

Logs/Alarms:

None.

Root Cause:

The contact has not published a phone number, or has not granted you access per the Microsoft Lync Privacy Relationship.

Recovery Action:

The rules that apply to Microsoft Lync 2010 presence and privacy relationships also apply to Avaya Lync Integration. For information on presence and privacy relationships, see the Microsoft Lync 2010 documentation. The following is a link to an online document: Microsoft Communicator Presence and Privacy Relationships.

Scripting access to WMI is not working

User Alert

There is a problem with this Windows Installer package. A script required for this install to complete could not be run. Contact your support personnel or package vendor.

Logs/Alarms

None.

Root Cause

The WMI repository on Windows XP is corrupted.

Recovery Action

Use the following steps to fix a corrupted WMI repository on Windows XP. For more information, see *Avaya one-X® Communicator Troubleshooting* (16–603218).

1. From the **Start** menu, select **Run**.
2. In the Run window, type `CMD.EXE`.

3. Enter the following command `net stop winmgmt`. Then press **Enter** on your keyboard.
4. Rename the folder `%windir%\System32\Wbem\Repository` (for example, you can rename the folder as `%windir%\System32\Wbem\Repository_Bad`).

   Note:

   `%windir%` represents the path to the Windows directory, which is typically `C:\Windows`.
5. Open the Command Prompt window. To launch this window from the **Start** menu, do the following:

   • Click **Start** > **Programs** > **Accessories** > **Command Prompt**.
6. Type the following command:

   ```
   net start winmgmt
   EXIT
   ```

   Press **Enter** on your keyboard after each line.

Unable to connect to remote server - 503 Server Unavailable – Deprecated in R 6.2.2

User Alert:

Server or connection to the server is down. Please contact your administrator.

Logs/Alarms:

011-03-24 15:43:17.470 11 QueryConnections WebException: The remote server returned an error: (503) Server Unavailable

2011-03-24 15:43:17.470 11 RestProvider.ShowErrorMsgDialog Error: Server or connection to the server is down

Please contact your administrator.

2011-03-24 15:43:19.610 11 RestProvider.ShowErrorMsgDialog.Cleared Error: Server or connection to the server is down

Please contact your administrator

Root Cause:

No network connectivity between Avaya ACE and the Application Integration Engine (AIE).

Recovery Action:

- Ensure there is network connectivity between Avaya ACE and the AIE.
- Ensure that the AIE has been configured with the correct Avaya ACE administrator user name and password.

Windows Script Host configuration incorrect

This troubleshooting issue has been deprecated and does not apply to the current release.

User Alert:

Internet Explorer Script Error: Automation Server can't create object.

Logs/Alarms:

No Communicator Add-in logs

Root Cause:

Communicator Add-in unsuccessfully tries to access its data file when user selects a contact in the contact list

Recovery Action:

1. Open a Windows Explorer tool and navigate to the `Windows\system32` folder.
2. Check if the files `scrrun.dll` and `wscript.exe` exist.
3. Choose one of the following:
    a. If the files exist, sign out of Communicator and sign back in again.
    b. If the files do not exist, perform an internet search for Windows Script. Download the Windows Script software and install it.
4. If the problem persists, check the registry. From the Windows Start menu, enter the Run command **`regedit`**.
5. In the Registry Editor window, check for the entry `HKEY_CLASSES_ROOT \Scripting.FileSystemObject`.
6. If the entry does not exist, close the Registry Editor and open a command line window.
7. Change directories to the `Windows\system32` folder.
8. Enter the command **`regsvr32.exe scrrun.dll`**.
9. In the Registry Editor window, ensure that the entry `HKCR \Scripting.FileSystemObject` has been created.
10. Sign out of Communicator and sign back in again.

Chapter 15: Troubleshooting the one-X engine

Use this procedure to turn on debug logging for the one-X engine. The one-X logging levels are listed below. The default level is 3.

- 0 = EMERGENCY

  Emergency only - essentially no logging - application crash events

- 1= ALERT

  Alert Not used

- 2 = CRITICAL

  Critical - Error that will cause instability in the application

- 3 = ERROR

  Only error conditions - behavior that is not expected but will not cause application to crash

- 4 = WARNING

  Unexpected behavior that is not an error but should be investigated

- 5 = NOTICE

  Normal logging information that is essential operation of the program

- 6 = DEBUG

  Only for debugging information that can possibly be activated in the field

- 7 = DEBUG

  For very high level messages that are to occur potentially many times - for Message Logging

To turn on debug logging, you must edit the `config.xml` file located in the Avaya one-X Communicator for MSI installation folder. The folder is in the `APPDATA` system property.

To turn on default debug logging, add the following to the `config.xml` file.

```
<parameter>
<name>LocalLogLevel</name>
<value>6</value>
</parameter>
<parameter>
<name>LogCategoryList</name>
<value>ALL,</value>
</parameter>
<parameter>
<name>AudioLogLevel</name>
```

```
<value>6</value>
</parameter>
<parameter>
<name>AudioCategoryList</name>
<value> TRACE,API,DEBUG,</value>
</parameter>
```

To turn on maximum debug logging, add the following to the `config.xml` file.

```
<parameter>
<name>LocalLogLevel</name>
<value>7</value>
</parameter><parameter>
<name>LogCategoryList</name>
<value>ALL,</value>
</parameter><parameter>
<name>AudioLogLevel</name>
<value>7</value>
</parameter><parameter>
<name>AudioCategoryList</name>
<value>TRACE,API,DEBUG,</value>
</parameter>
```

Note:

To enable the new log setting, you must sign out and then sign back in to Communicator.

One-X Communicator log files are located in the user's Avaya one-X Communicator for MSI application data directory under the `APPDATA` system property.

The `Log Files` folder contains debug log files for several components. The main log file is `EndpointLog.txt`.

Chapter 16: Uninstall Lync Integration

This section contains the procedures for uninstalling the Avaya Lync Integration software deployed on the desktop.

Navigation

- Uninstalling Lync Integration from the local desktop on page 103
- Uninstalling Lync Integration from multiple machines on page 104

Uninstalling Lync Integration from the local desktop

Note:

- Avaya Lync Integration must be uninstalled before the Microsoft Lync 2010 client is uninstalled.
- Avaya Communicator Add-in must be uninstalled before the Microsoft Communicator client is uninstalled.

Before you begin

- You must have administrator privileges to uninstall the application.
- Close Lync 2010 before performing the uninstall.

Uninstallation notes

- If you attempt to uninstall Lync Integration from the Control Panel while an instance launched by a different user is still running, you receive the following message:
`The following application is running and cannot be terminated: Avaya Microsoft Lync Integration. The uninstaller cannot proceed. Continue by choosing one of the following options:`
`- Restart the system and repeat the uninstall from the Control Panel.`
`- Uninstall using the command line procedure Uninstalling Lync Integration from multiple machines.`
- You may receive a prompt to restart the system. If this occurs, you must reboot the machine to complete the uninstallation.
- If a version of one-X Communicator lower than release 6.1 is installed on the same machine as Lync Integration, then the one-X Communicator software must be re-installed after the Lync Integration uninstallation.

Uninstallation notes
- Based on industry standard practise, the uninstall process does not remove the Lync Integration registry keys. The registry keys can be removed manually from `HKey_Current_User\Software\Avaya\Avaya Microsoft Integration`. - The uninstall process does not remove the existing product log files. When upgrading from a previous version of the Lync client to a more recent version of the Lync client or from the Communicator client to the Lync client, the log destination folder changes. The log files from the previous client must be removed manually.

Procedure

1. From the Windows **Start** menu, select **Settings**, **Control Panel**, then **Add or Remove Programs**.
2. In the Add or Remove Programs window, select **Avaya Microsoft Lync Integration** and then click **Remove**.
3. You are prompted to confirm the uninstall. Click **Yes**.

Uninstalling Lync Integration from multiple machines

Note:

- Avaya Lync Integration must be uninstalled before the Microsoft Lync 2010 client is uninstalled.
- Avaya Communicator Add-in must be uninstalled before the Microsoft Communicator client is uninstalled.

To facilitate the integration of the Avaya Lync Integration software into bulk software distribution and installation infrastructure, the Lync Integration software can be uninstalled without end-user intervention, using the following command.

```
msiexec /x [LyncIntegration | MCAddin]-<release#>.msi
REBOOT=ReallySuppress /L*v [LyncIntegration | MCAddin].uninstall.log /q
```

Uninstallation notes

- The `/q` parameter kills the running Lync 2010 client, Lync Integration, and one-X engine processes. The uninstallation cannot proceed if the Microsoft Lync Client is running.
- Any interaction with the Microsoft Lync client or Microsoft Communicator by an end user during the uninstallation can result in a failed uninstallation. The `[LyncIntegration | MCAddin].install.log` will indicate the operation is complete. Please allow enough time for completion of the operation prior to restarting the Lync 2010 client (up to 1 minute,

for slower machines). Failure to do so will result in an unsuccessful uninstallation and the uninstallation process must be repeated.

- You must have administrator privileges to uninstall the application. On Windows 7, you must open the Command Prompt window using the **Run as administrator** option. To run the Command Prompt as administrator:

    a. From the Windows start menu, type **`Command Prompt`** in the **Search programs and files** box.

    The Command Prompt application is displayed in the list under **Programs**.

    b. Right click on **Command Prompt** and select **Run as administrator**.

- You may receive a prompt to restart the system. If this occurs, you must reboot the machine to complete the uninstallation.
- If a version of one-X Communicator lower than release 6.1 is installed on the same machine as Lync Integration, then the one-X Communicator software must be re-installed after the Lync Integration uninstallation.
- Based on industry standard practise, the uninstall process does not remove the Lync Integration registry keys. The registry keys can be removed manually from `HKey_Current_User\Software\Avaya\Avaya Microsoft Integration`.
- The uninstall process does not remove the existing product log files. When upgrading from a previous version of the Lync client to a more recent version of the Lync client or from the Communicator client to the Lync client, the log destination folder changes. The log files from the previous client must be removed manually.

To validate the uninstallation, view the log file `LyncIntegration.uninstall.log` or `MCAddin.uninstall.log`. The file contains text readable output of the uninstallation process and indicates successful uninstall of Lync Integration.

Chapter 17: Upgrade Lync Integration

This section contains the procedures for upgrading the Avaya Lync Integration software deployed on the desktop. Note that the Avaya one-X® engine is now embedded with the Lync Integration software and does not need to be upgraded separately.

Upgrading Lync Integration

Upgrade the Avaya Lync Integration components in the following order:

1. Avaya ACE. See *Avaya Agile Communication Environment™ Planning and Installation* (NN10850–004).
2. Lync Integration.

Before you begin

- Before upgrading Lync Integration, review the chapters listed under Work flow for deploying Lync Integration on page 45 to ensure that all prerequisites have been met.
- To upgrade Avaya Lync Integration, you must perform the procedure to uninstall the old version and then install the new version.

  Note that all versions of both Lync Integration and Communicator Add-in must be uninstalled before proceeding to install the current version.
- Before you can install the new version, you must build the `.msi` file using the Configurator tool.

  Note that if an earlier version of the Configurator is installed, it must be removed prior to installing the new Configurator.
- You must close Lync 2010 before performing the upgrade.

Procedure

1. Uninstall the old version of Lync Integration. Perform one of the following procedures:
   - Uninstalling Lync Integration from the local desktop on page 103
   - Uninstalling Lync Integration from multiple machines on page 104
2. Install the Configurator. Perform the procedure Installing the Configurator on page 71.

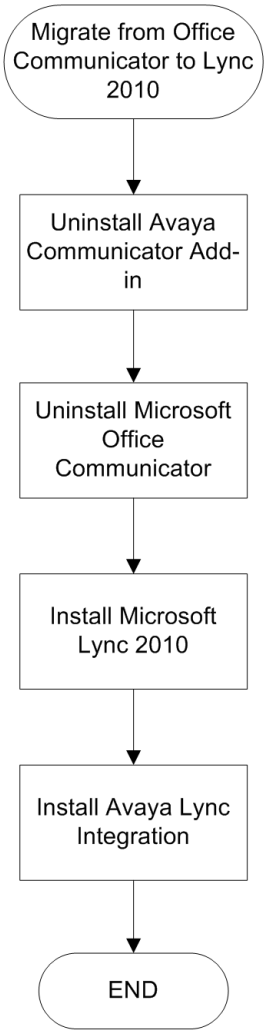
3. Build the .msi file. Perform the procedure Building the install package on page 71.
4. Install Lync Integration. Perform one of the following procedures:
    - Installing Lync Integration locally on page 74
    - Installing the Lync Integration on multiple machines from a remote server on page 76

Chapter 18: Migrating from Communicator Add-in to Lync Integration

This section describes the steps to follow when migrating from Microsoft Communicator with Communicator Add-in to Microsoft Lync 2010 with Lync Integration. Avaya Communicator Add-in and Avaya Lync Integration cannot be installed on the same workstation.

Upgrade Lync Integration procedures

This task flow shows the procedures you perform to upgrade Lync Integration.



Navigation

- The process to uninstall Communicator Add-in and Lync Integration is the same. See Uninstall Lync Integration on page 103.
- For the procedure to uninstall Microsoft Office Communicator, see the Microsoft documentation.
- For the procedure to install Microsoft Lync 2010, see the Microsoft documentation.
- Before installing Lync Integration, review the chapters listed under Work flow for deploying Lync Integration on page 45 to ensure that all prerequisites have been met. To install Lync Integration, see Deploy Lync Integration on the desktop on page 69

Chapter 19: Migrating from Avaya AIE 3.0.x to Avaya ACE™ 6.2.1

The following sections describe how to log into the Avaya ACE server and migrate AIE R 3.0.x database and configuration data to Avaya ACE R 6.2.1. For more information about Avaya ACE migration and about verifying user roles and licenses after migration, see the following documents:

- *Avaya Agile Communication Environment™ Planning and Installation* (NN10850–004): This document describes installation, migration and post-migration, and licensing.
- *Avaya Agile Communication Environment™ Secure Communication Fundamentals* (NN10850–006): This document describes security configuration. You may need to configure certificates after migration if you are using Avaya Aura® System Manager as a certificate authority for Avaya Aura® service providers.
- *Avaya Agile Communication Environment™ User and Security Administration* (NN10850–010): This document describes user administration and roles management. You must verify user roles after the migration.

Logging in to Avaya ACE host

Avaya ACE does not support logging in to the server remotely with ***root*** user credentials. However, most of the administrative tasks need root credentials. To obtain ***root*** credentials, log in as ***sysadmin*** user and change to ***root*** user.

Before you begin

You must know the ***sysadmin*** and ***root*** credentials.

Procedure

1. Log in to the Avaya ACE host as ***sysadmin*** user.
   For HA deployments, log in to the active host.
2. Change to ***root*** user. Type `su - root` and press **Enter**.
   When changing to the root user, always use the command syntax **`su - root`**. Using a dash ensures that you have the correct environment when entering commands as the root user.
3. Enter the ***root*** password when prompted for it.

Migrating AIE database and configuration data

If you are migrating AIE, perform this procedure, after you install Avaya ACE, to migrate database and configuration data from the backup file. For HA deployments, migrate this data on the active host.

Before you begin

Ensure that you have:

- Obtained the ***sysadmin*** and ***root*** credentials. See Logging in to the Avaya ACE host on page 111.
- Transferred the stored AIE backup file on to the Avaya ACE host.
- Defined the following parameters as the migration tool prompts you for the values.

Parameter	Description	Value
WAS admin user name	WebSphere admin user ID.	
WAS admin user password	Password for the WebSphere admin user ID.	
Database username with restore privilege	***root*** user ID.	
Database password	Password for the ***root*** database user.	
AIE backup file name	Name of the backup file containing the AIE Release 3.0.x database and configuration data.	
Directory that holds the AIE backup file	Location where the backup file containing the AIE Release 3.0.x database and configuration data is stored on the local ACE host.	
Authentication type	The authentication type can be internal or external. Internal authentication uses the Avaya ACE database credentials to authenticate while external authentication uses Enterprise credentials to authenticate. For more information, see *Avaya Agile Communication Environment™ User and Security Administration,* (NN10850–010). **Note:** You can change the authentication type assigned to a user through the Avaya ACE GUI user management pages.	

Procedure

1. Log in to the Avaya ACE host. See Logging in to the Avaya ACE host on page 111.
2. Change directories. Enter:
   ```
   cd /opt/avaya/ace/install
   ```
3. Run the migrate tool and follow the prompts. Enter:
   ```
   ./migrate30aieto621.sh
   ```