
Basic AD-based Call Routing for Dummies

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About this Page


- This document details how to configure the SBC for Active Directory-based call routing.
- This document explains how the SBC handles AD caching and repetitive AD lookups.


Related Articles

- [Configuring Active Directory](#)
- [Configuring Domain Controllers](#)
- [Querying the Active Directory Cache](#)
- [Configuring Call Routing Tables](#)
- [Configuring Transformation Tables](#)

Prerequisites

-  Requires Sonus SBC1000/2000 Version 2.2 or later

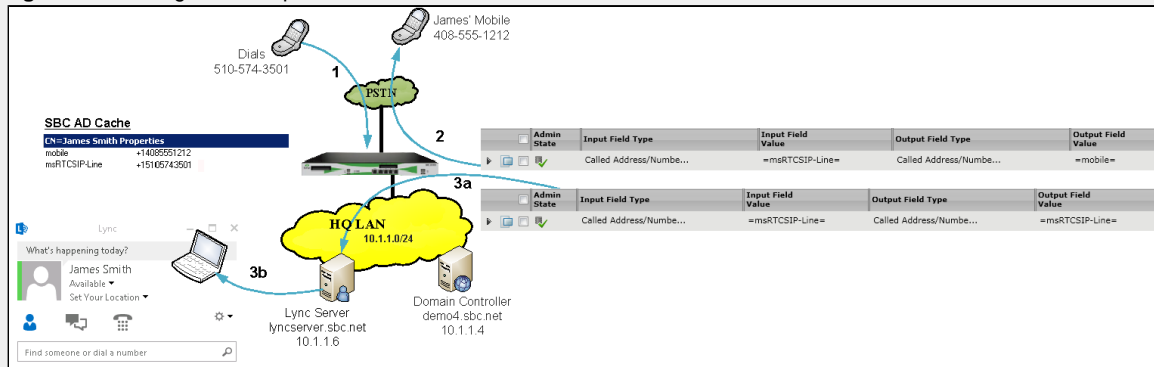
-  This document assumes the user has a working knowledge of the SBC and its WebUI.

-  This document assumes the user has a working knowledge of Microsoft's Active Directory

Summary

Below is the call diagram example used as a configuration reference for the remainder of this document.

Figure 1: Call Diagram Example



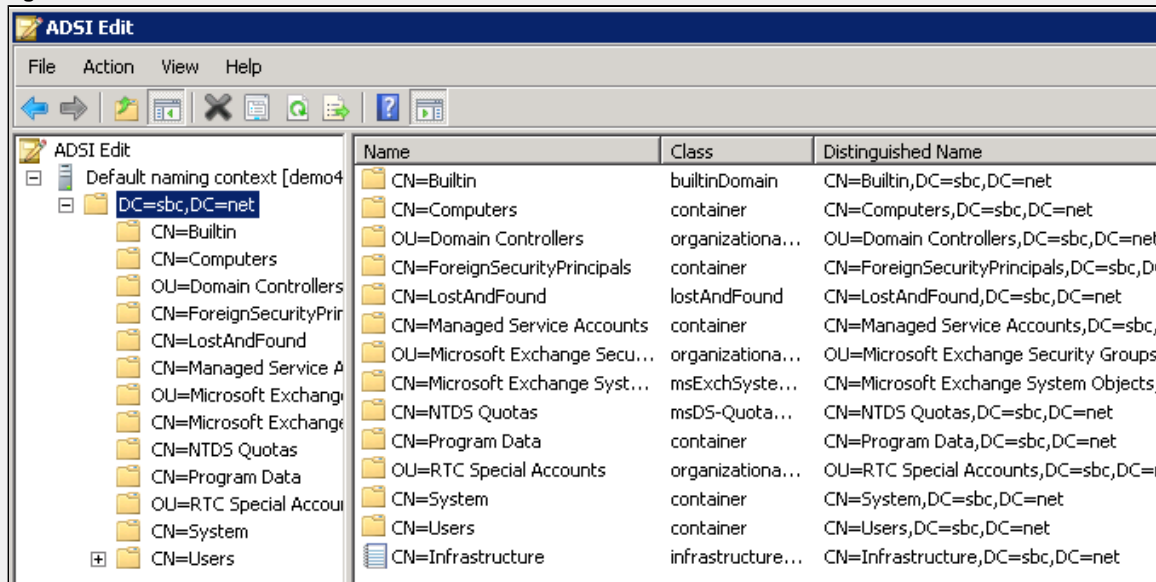
Step	Action
1	PSTN call arrives at SBC. SBC processes corresponding SG, Call Route & Transformation Table
	Call Route/Transformation Table queries the AD cache. The called number is checked against all msRTC SIP-Line records per the Input portion of the transformation entry.
2	James' msRTC SIP-Line entry matches the called number, +15105743501. James' mobile number is returned from the AD cache. A call is placed to James' mobile, +14085551212.
	All of James' AD records are recorded into a record set. This record set is used for all subsequent AD queries for this call.
3a	In forking the call to Lync, the next Call Route entry/Transformation Table is executed. The <i>record set</i> (not the AD cache) is searched to see if the called number matches the msRTC SIP-Line. This type of check is performed simply to ascertain if the called number belongs to a Lync user. If it matches, the same number that was searched is returned and the call request is forwarded to the Lync Server.
3b	The Lync Server processes the INVITE, sending it out to James' Lync client

Before Beginning...

Before beginning the AD configuration, investigate and answer the following:

- The FQDN/IP of the Domain Controller
- What AD attribute will be used as key to retrieve records? msRTC SIP-Line, name, or mail are common AD attribute to set as the LDAP search criteria.
- What area of the Active Directory should be searched?

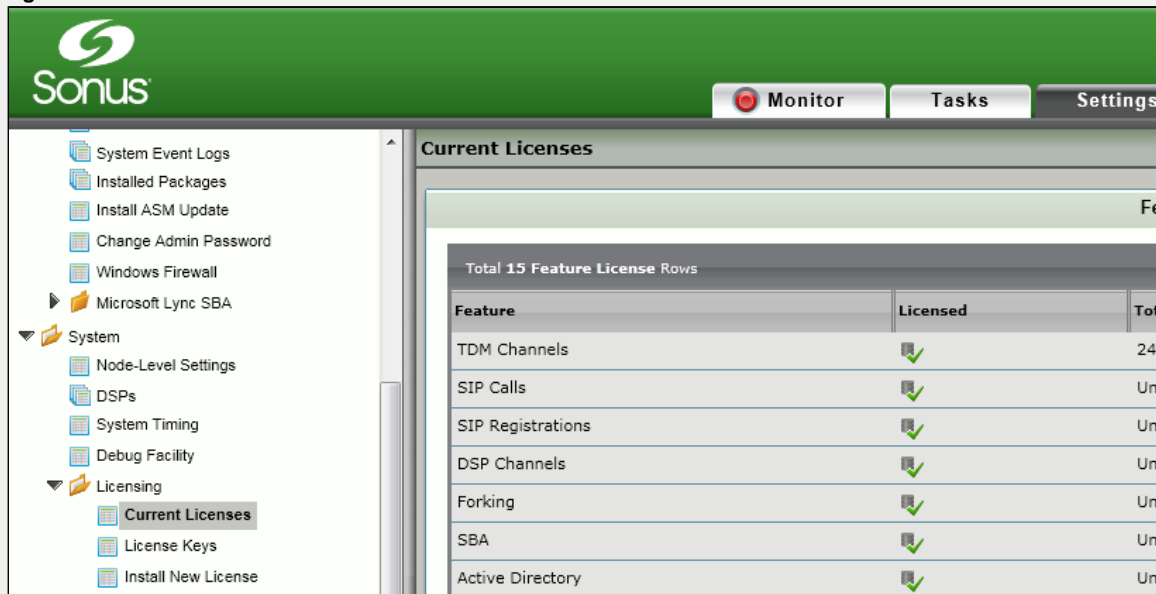
Figure 2: ADSI Edit



ADSIedit showing a typical location for an AD search

- Does the SBC have a license for Active Directory?

Figure 3: Current Licenses



✓ Active Directory is part of the SBC base license. The latest base licenses are available at [Sonus Download Center](#).

The following diagrams depict the SBC's Active Directory settings for:

- Configuring a *Domain Controller*
- Setting the *Configuration* parameters the SBC will use to interoperate with the domain controller

Figure 4: Configuration for Individual Domain Controllers

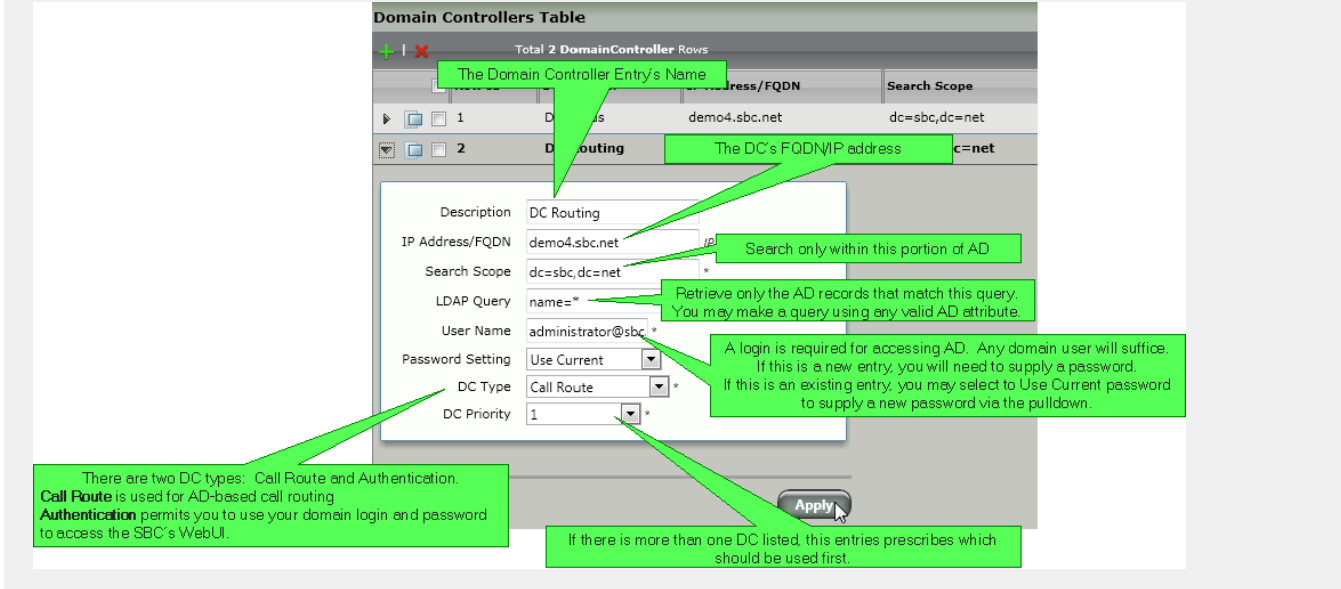
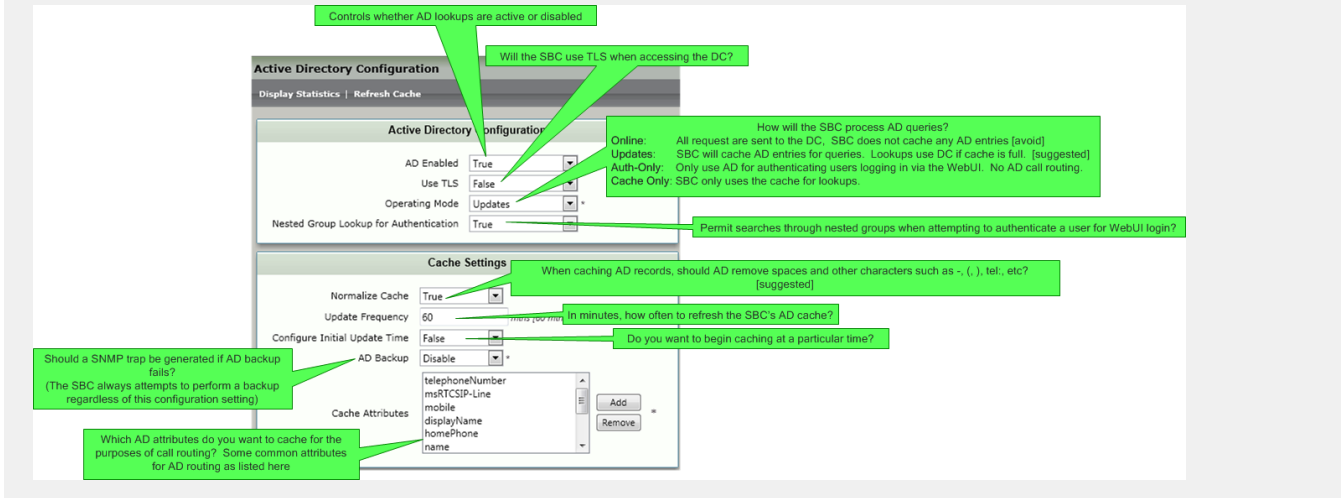


Figure 5: Global Configuration for SBC-to-DC Interactions



SBC AD Configuration

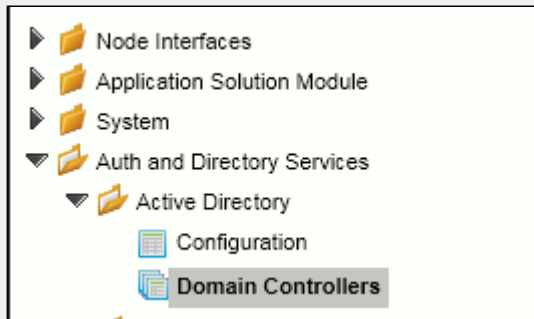
The SBC must be configured for:

- Active Directory Integration
- Forked Calling
- AD-based Call Routing

Active Directory Integration for Call Routing

1. Click the *Settings* tab in the top navigation, then select *Domain Controllers* in the left-hand navigation

Figure 6: Domain Controllers



2. Enter the AD information for your network

Figure 7: Enter AD Information

The screenshot shows a configuration window titled "Domain Controllers Table" with a table of 2 rows. Below the table is a form for editing the selected row (ID 2).

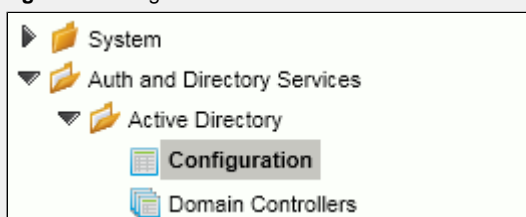
Row ID	Description	IP Address/FQDN	Search Scope
1	DC Creds	demo4.sbc.net	dc=sbc,dc=net
2	DC Routing	demo4.sbc.net	dc=sbc,dc=net

Description	<input type="text" value="DC Routing"/>
IP Address/FQDN	<input type="text" value="demo4.sbc.net"/> <small>IP Address or FQDN *</small>
Search Scope	<input type="text" value="dc=sbc,dc=net"/> *
LDAP Query	<input "="" type="text" value="name="/> *
User Name	<input type="text" value="administrator@sbc"/> *
Password Setting	<input type="text" value="Use Current"/> ▼
DC Type	<input type="text" value="Call Route"/> ▼ *
DC Priority	<input type="text" value="1"/> ▼ *

Apply

3. Click *Configuration* in the left-hand navigation.

Figure 8: Configuration



4. Configure the *Active Directory Configuration* as shown. Add whatever *Cache Attributes* you plan to use.

✓ The minimum configuration for this example document should include the attributes: msRTCSIP-Line, name, displayName, mail, telephoneNumber

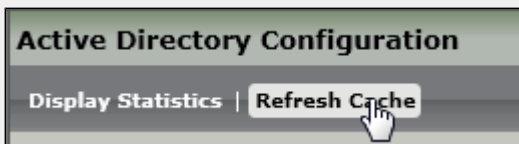
Figure 9: Active Directory Configuration

The screenshot shows the 'Active Directory Configuration' interface. At the top, there are links for 'Display Statistics' and 'Refresh Cache'. Below this, the 'Active Directory Configuration' section contains four dropdown menus: 'AD Enabled' (True), 'Use TLS' (False), 'Operating Mode' (Updates), and 'Nested Group Lookup for Authentication' (True). The 'Cache Settings' section includes 'Normalize Cache' (True), 'Update Frequency' (60 mins [60 mins...30 days]), 'Configure Initial Update Time' (False), and 'AD Backup' (Disable). The 'Cache Attributes' section features a list box containing 'telephoneNumber', 'msRTCSIP-Line', 'mobile', 'displayName', 'homePhone', and 'name', with 'Add' and 'Remove' buttons to its right.

Active Directory Verification

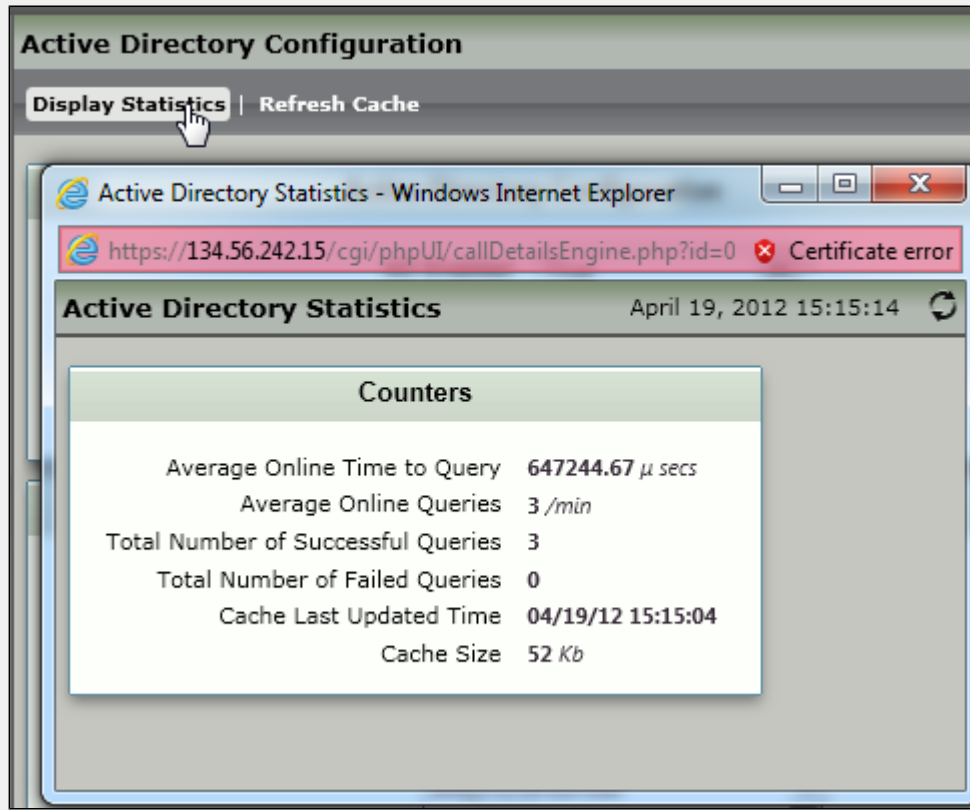
1. With the AD configuration completed, click *Refresh Cache*.

Figure 10: Refresh Cache



2. Click *Display Statistics* and verify that the AD queries are succeeding.

Figure 11: Display Statistics



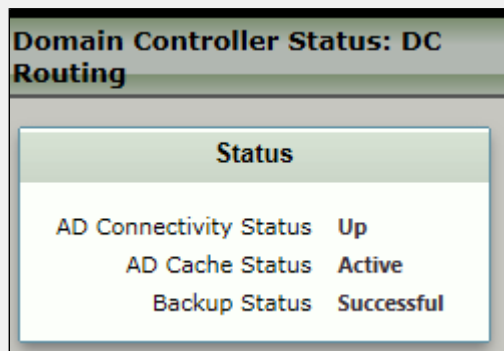
3. In the Domain Controller configuration, check the DC Status

Figure 12: Domain Controllers Table

Row ID	Description	IP Address/FQDN	Search Scope	LDAP Query	DC Type	Priority	Status
1	DC Creds	demo4.sbc.net	dc=sbc,dc=net	name=*	Authentication	1	Status
2	DC Routing	demo4.sbc.net	dc=sbc,dc=net	name=*	Call Route	1	Status

Click to popup status of this Domain Controller.

Figure 13: Domain Controller Status



- Select the *Tasks* tab in the top navigation and click *Active Directory Cache Query*. In the form, pick an AD attribute from the pulldown and supply a corresponding value.

Figure 14: Active Directory Cache Query

Active Directory Cache Query

Property to Match:

Value to Match:

Query Results

Results:

- Attribute=telephoneNumber
Value=3502
- Attribute=msRTCSIP-Line
Value=+15105743501
- Attribute=msRTCSIP-OptionFlags

! Queries of the msRTCSIP-Line must match precisely what appears in the Lync *Line URI* for the desired user, unless *Normalized Cache* is configured to *True*. If the cache is normalized, the tel: will be removed from the Lync *User Line URI*.

SBC AD-based Call Routing

Use the following instructions to create Call Routes and Transformation Tables that perform the call routing noted detail in the Summary section diagram.

- Create a transformation table with an entry to search for a msRTCSIP-Line entry that matches the called number and returns the mobile number.

Figure 15: Calls to Mobile

Admin State	Input Field Type	Input Field Value	Output Field Type	Output Field Value	Match Type
<input checked="" type="checkbox"/>	Called Address/Numbe...	=msRTCSIP-Line=	Called Address/Numbe...	=mobile=	Mandatory

- Create a new call route table, then a call route entry to the table. In the example, the *Calls to Mobile* transformation table (above) is added to the call route (below).

Figure 16: Create Call Route Table

Route Details

Description **Failover to Mobile**
 Admin State **Disabled**
 Route Priority **1**
 Call Priority **Normal**
 Number/Name Transformation Table **Calls to Mobile**

Destination Information

Destination Type **Normal**
 Message Translation Table **None**
 Cause Code Reroutes **sba: UC Reroute**
 Cancel Others upon Forwarding **Disabled**
 Fork Call **Yes**

(ISDN) sba: ISDN SG for 242.8 vxgw2

Destination Signaling Groups *

Media

Media Transcoding **Enabled**
 Media List **None**

Quality of Service

Quality Metrics Number of Calls **10**
 Quality Metrics Time Before Retry **10**
 Min. ASR Threshold **0**
 Min. MOS Score **0.0**
 Enable Max. R/T Delay **Enabled**
 Max. R/T Delay **9999**
 Enable Max. Jitter **Enabled**
 Max. Jitter **3000**

3. Create a second transformation table with an entry to search for a msRTCSIP-Line entry that matches the called number.

Figure 17: Create Transformation Table

Is the call to a Lync device?						
	Admin State	Input Field Type	Input Field Value	Output Field Type	Output Field Value	Match Type
Total 1 Transformation Entry Row	<input type="checkbox"/>	Called Address/Numbe...	=msRTCSIP-Line=	Called Address/Numbe...	=msRTCSIP-Line=	Mandatory

4. Add a second entry to your Call Route table to send the call to the Lync Server. As before, add the transformation table above to the call route below.

Figure 18: Add Entry

Route Details

Description	Passthru to Lync
Admin State	Enabled
Route Priority	1
Call Priority	Normal
Number/Name Transformation Table	Is the call to a Lync device?

Destination Information

Destination Type	Normal
Message Translation Table	None
Cause Code Reroutes	sba: UC Reroute
Cancel Others upon Forwarding	Disabled
Fork Call	Yes
Destination Signaling Groups	<div style="border: 1px solid gray; padding: 2px; width: 150px; height: 40px; margin-top: 5px;">(SIP) lyncserver</div>

Media

Media Transcoding	Enabled
Media List	sba: UC Media List w/ Crypto

Quality of Service

Quality Metrics Number of Calls	10
Quality Metrics Time Before Retry	10
Min. ASR Threshold	0
Min. MOS Score	0.0
Enable Max. R/T Delay	Enabled
Max. R/T Delay	9999
Enable Max. Jitter	Enabled
Max. Jitter	3000

5. Your call route table should look like this:

Figure 19: Completed Table

AD based Calling						
	Admin State	Priority	Transformation Table	First Signaling Group	Description	Fork Call
Total 2 Call Route Entry Rows	<input checked="" type="checkbox"/>	1	Calls to Mobile	(ISDN) sba: ISDN SG for 242.8 vxgw2	Call the mobile	Yes
	<input checked="" type="checkbox"/>	1	Is the call to a Lync device?	(SIP) lyncserver	Calls to Lync	No

i If you are planning to employ AD lookups for Lync Line URI (msRTCSIP-Line), your searches will likely require additional number translations. Click here to view some common number normalizations for msRTCSIP-Line AD lookups.

It is often necessary to change (normalize) a number before performing an AD lookup. The vast majority of lookups require just the addition of +countrycode (i.e. +1 for the US) for a number that is already 10 digits (areacode+number).

The Lync Line URI (msRTCSIP-Line) is different as it is always prepended with *tel:* and often postpended with *;ext=number*. Since AD searches must be exact matches, the number must be corrected before the search. Below are some common normalization transformations.

✓ If *Normalize Cache* is configured to *True*, the *tel:* will automatically be removed from msRTCSIP-Line before the SBC caches the number. Setting *Normalize Cache* to *True* is recommended.

If your Lync Line URI: looks like this:

Figure 20: Lync Line URI

Line URI:

tel:+15105743501 ?

These are two common normalizations:

Figure 21: Normalize Cache set to True

Calls to Mobile April 23, 2012 16:59:59							
Total 2 Transformation Entry Rows							
Admin State	Input Field Type	Input Field Value	Output Field Type	Output Field Value	Match Type	Description	
<input type="checkbox"/>	Called Address/Number	(.*)	Called Address/Number	+1\1	Mandatory	Normalize the Called...	
<input type="checkbox"/>	Called Address/Number	=msRTCSIP-Line=	Called Address/Number	=mobile=	Mandatory	AD lookup for mobile	

Figure 22: Normalize Cache set to False

Calls to Mobile April 23, 2012 16:59:25							
Total 2 Transformation Entry Rows							
Admin State	Input Field Type	Input Field Value	Output Field Type	Output Field Value	Match Type	Description	
<input type="checkbox"/>	Called Address/Number	(.*)	Called Address/Number	tel:+1\1	Mandatory	Normalize the Called...	
<input type="checkbox"/>	Called Address/Number	=msRTCSIP-Line=	Called Address/Number	=mobile=	Mandatory	AD lookup for mobile	

If your Lync Line URI: looks like this:

Figure 23: Lync Line URI

Line URI:

tel:+15105743501;ext=3501 ?

These are two common normalizations for a 4 digit extension:

Figure 24: Normalize Cache set to True

Calls to Mobile April 23, 2012 17:01:28							
Total 2 Transformation Entry Rows							
	Admin State	Input Field Type	Input Field Value	Output Field Type	Output Field Value	Match Type	Description
	<input checked="" type="checkbox"/>	Called Address/Number	(.*)(...)	Called Address/Number	+1\1\2;ext=\2	Mandatory	Normalize called for...
	<input checked="" type="checkbox"/>	Called Address/Number	=msRTCSIP-Line=	Called Address/Number	=mobile=	Mandatory	AD lookup for mobile

Figure 25: Normalize Cache set to False

Calls to Mobile April 23, 2012 17:02:24							
Total 2 Transformation Entry Rows							
	Admin State	Input Field Type	Input Field Value	Output Field Type	Output Field Value	Match Type	Description
	<input checked="" type="checkbox"/>	Called Address/Number	(.*)(...)	Called Address/Number	tel:+1\1\2;ext=\2	Mandatory	Normalize called for..
	<input checked="" type="checkbox"/>	Called Address/Number	=msRTCSIP-Line=	Called Address/Number	=mobile=	Mandatory	AD lookup for mobile



If your *Operating Mode* is configured to *Online*, normalization should always include tel: as *Normalize Cache* is not available in *Online* mode. As stated before, *Online* mode is **not** recommended.

Additional Notes

The diagram below provides a pictorial representation for conceptualizing how data is processed through Transformation Table entries.

Figure 26: Data Process

