



Microsoft®
Lync™ Server 2010

Comunicaciones Unificadas

Integración Asterisk 1.8



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Comunicaciones Unificadas Virtualizadas

- Se realizara la integración entre Lync Server 2010 y Asterisk 1.8 para poder realizar y recibir llamadas.
- **Requerimientos:**
 - Lync Server Frontend con Mediation Server Configurado
 - Asterisk 1.8 con sip.conf configurado

La configuración necesaria se encuentra se pueden consultar en <http://bit.ly/wKNtsj>

Objetivo: Vamos a configurar internos de 4 dígitos para Lync y Asterisk

- 1000 / 1999 (Lync)
- 2000 / 2999 (Asterisk)



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Configuramos la trama para Lync -> Lync Server Control Panel




Lync Server Control Panel

Validamos nuestra cuenta

Windows Security [X]

Connecting to LYFE01.itsanchez.local.



Domain: ITSANCHEZ
☐ Remember my credentials

OK Cancel



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Seleccionamos -> Voice Routing -> Trunk Configuration

Microsoft Lync Server 2010 Administrator | [Sign out](#) 4.0.7577.0

Home Users Topology IM and Presence **Voice Routing** Voice Features Response Groups

Dial Plan Voice Policy Route PSTN Usage **Trunk Configuration** Test Voice Routing

Create voice routing test case information

Search

+ New Edit Action Commit

Name	Scope	State	Normalization rules	Description
Global	Global	Committed	1	

Seleccionamos -> Global -> Edit -> Show details...

Search

+ New Edit Action Commit

Global	Global	
--------	--------	--

Show details...
Select all
Delete



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Realizamos el siguiente ajuste -> Ok

Edit Trunk Configuration - Global



OK



Cancel

Scope: Global

Name:

Global

Maximum early dialogs supported:

20

Encryption support level:

Not supported



Enable media bypass



Centralized media processing



Enable refer support

Associated Translation Rules



New



Copy



Paste



Select...



Show details...

Remove



Translation rule

State

Pattern to match

Translation pattern



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Aplicamos el cambio -> Commit -> Commit all

Dial PlanVoice PolicyRoutePSTN UsageTrunk ConfigurationTest Voice Routing

Create voice routing test case information

+ New ▾✎ Edit ▾Action ▾Commit ▾

Name ▴

Global

Review uncommitted changes

Commit all

Cancel selected changes

Cancel all uncommitted changes

via bypass

Rules

0



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Confirmamos el cambio -> Commit

Uncommitted Voice Configuration Settings ⓘ ✕

Trunks ⓘ

Identity	Action	New value (enable bypass)	Old value (enable bypass)
Global	Modified		

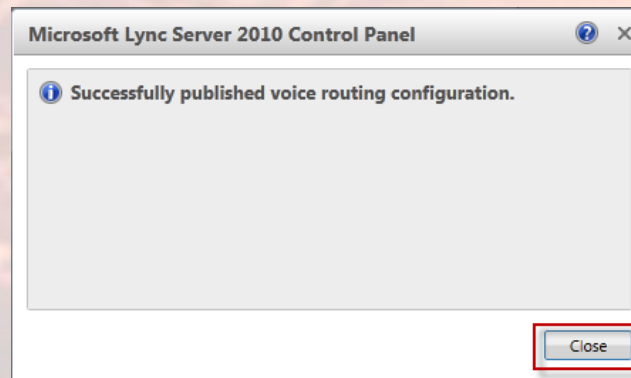
Commit Cancel



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Confirmamos que el cambio fue exitoso -> Close



Seleccionamos -> Voice Routing -> Dial Plan -> Global -> Show details...

Microsoft Lync Server 2010

Home Users Topology IM and Presence **Voice Routing** Voice Features Response Groups Conferencing Clients

Dial Plan Voice Policy Route PSTN Usage Trunk Configuration Test Voice Routing

Create voice routing test case information

Search

+ New Edit Action Commit

Name	Scope	State	Normalization rules	Description
Global	Global	Committed	1	

Show details...
Select all
Delete



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Ponemos un nombre → **Remove** (eliminamos la configuración predeterminada)

Edit Dial Plan - Global

✓ OK ✗ Cancel

Simple name:*

ITSanchez

Description:

Dial-in conferencing region:

External access prefix:

Associated Normalization Rules

+ New Copy Paste Select... Show details... Remove ↑ ↓

Normalization rule	State	Pattern to match	Translation pattern
Prefix All	Committed	^\d{11}\$	+\$1



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Seleccionamos → + New

Edit Dial Plan - Global

✓ OK ✗ Cancel

Simple name:*

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Description:

Dial-in conferencing region:



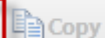
External access prefix:



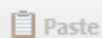
Associated Normalization Rules



New



Copy



Paste



Select...



Show details...

Remove



Normalization rule	State	Pattern to match	Translation pattern



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Seleccionamos un nombre → configuramos como se muestra en la pantalla y nos desplazamos hacia abajo (le regla disca todo los números que empiezan con 2 y tiene 4 dígitos (internos de Asterisk))

Edit Dial Plan ▶ New Normalization Rule



OK



Cancel



Name:*

Internos Asterisk

Description:

Build a Normalization Rule

Fill in the fields that you want to use, or create the rule manually by clicking Edit.

Starting digits:

2

Length:

Exactly



4



Digits to remove:

0



Digits to add:



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Ajustamos los datos → Ok

Edit Dial Plan ▶ New Normalization Rule

 **OK**

 **Cancel**

Length:

Exactly ▼ 4 ▲▼

Digits to remove:

0 ▲▼

Digits to add:

Pattern to match:*

^(2\d{3})\$

Translation rule:*

\$1

Edit

Reset



☐ Internal extension



Disled number to test:



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Confirmamos → Ok

Edit Dial Plan - Global



OK



Cancel



Simple name:*

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Description:

Dial-in conferencing region:



External access prefix:



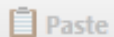
Associated Normalization Rules



New



Copy



Paste



Select...



Show details...

Remove



Normalization rule	State	Pattern to match	Translation pattern
Internos Asterisk	Uncommitted	^(2\d{3})\$	\$1



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Global → Commit → Commit all

+ New ▼


✎ Edit ▼

Action ▼

Commit ▼



Name ▲

 Global

Review uncommitted changes

Commit all

Cancel selected changes

Cancel all uncommitted changes

Normalization rules

Description



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Lync muestra los cambios → Commit

Uncommitted Voice Configuration Settings

Dial plan

Identity	Action	New value (description)	Old value (description)
Global	Modified		

Normalization rule

Identity	Action	New value (pattern to match)	Old value (pattern to match)
Global/Internos Asterisk	Added	^(2\d{3})\$	

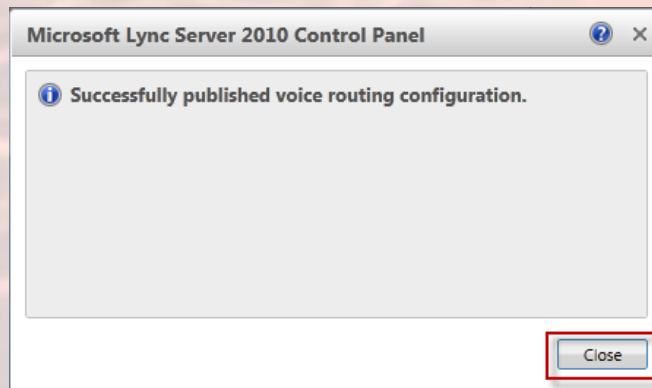
Commit Cancel



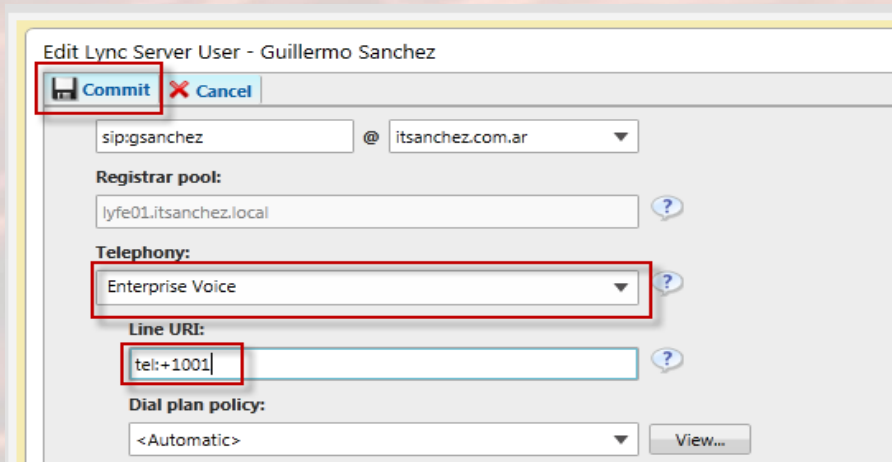
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Los cambios fueron realizados → Close



Desde Lync Server Control Panel -> Configuramos el interno 1001 para una cuenta de Lync, es importante tener en cuenta que la cuenta tiene que estar configurada con Enterprise Voice -> Commit





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En Voice Routing -> Route -> Click en LocalRoute -> Edit -> Delete

Home Users Topology IM and Presence Voice Routing Voice Features Response Groups Conferencing Clients External User

Dial Plan Voice Policy **Route** PSTN Usage Trunk Configuration Test Voice Routing

Create voice routing test case information

Search

+ New Edit Move up Move down Action Commit

Name	State	PSTN usage	Pattern to match
LocalRoute	Committed		^\(+1[0-9]{10})\$

Copy
Paste
Show details...
Select all
Delete

Seleccionamos -> + New

+ New Edit Move up Move down Action Commit

Name	State	PSTN usage	Pattern to match
LocalRoute	Uncommitted		^\(+1[0-9]{10})\$



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Seleccionamos un nombre → Asterisk (nos desplazamos mas abajo)

New Voice Route

✓ OK ✗ Cancel ?

Name:*

Asterisk

Description:

Build a Pattern to Match

Add the starting digits that you want this route to handle, or create the expression manually by clicking Edit.

Starting digits for numbers that you want to allow:

Type a valid number and then click Add.

Add

Exceptions

Remove

Match this pattern:*



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En Associated gateways -> Add..

New Voice Route

☐ Suppress caller ID

Alternate caller ID:

Associated gateways:

Associated PSTN Usages

PSTN usage record	Associated voice policies



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Seleccionamos la central -> Ok

Select Gateway

Service	Site
PstnGateway:192.168.50.220	ITSanchez

OK Cancel



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Seleccionamos -> Ok

New Voice Route

Seleccionamos -> Commit -> Commit All

Name	State	PSTN usa
LocalRoute	Uncommitted	
Asterisk	Uncommitted	

Review uncommitted changes
Commit all
Cancel selected changes
Cancel all uncommitted changes



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Seleccionamos -> Commit

Uncommitted Voice Configuration Settings

Routes

Identity	Action	New value (pattern to match)	Old value (pattern to match)
LocalRoute	Deleted	^\(+1[0-9]{10})\$	^\(+1[0-9]{10})\$
Asterisk	Added	.*	

Commit Cancel

Seleccionamos -> Close

Microsoft Lync Server 2010 Control Panel

Successfully published voice routing configuration.

Close



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Ingresamos por SSH a Asterisk -> ejecutamos `cd /etc/asterisk`
`vi sip.conf`

Presionamos [i] en modo – INSERT – (copiamos las siguientes líneas)

[2001]

type = friend

callerid = Interno Asterisk [2001] ; Caller ID

secret = 2001 ; Password

host = dynamic

context=from-asterisk ; Contexto Asterisk

canreinvite = no

nat=yes

dtmfmode = rfc2833

mailbox = 2001

qualify = yes

disallow = all

allow = alaw

transport = udp



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Presionamos -> [ESC] :wq!

```
[general]
context=default                ; Contexto Predeterminado
allowoverlap=no
udpbindingaddr=0.0.0.0
port=5060
bindport=5060
bindaddr=0.0.0.0
tcpenable=yes
srvlookup=yes
notifyhold = yes
disallow=all
allow=alaw
allow=ulaw

[Trama_Lync]
type = friend
port = 5068
canreinvite=no
host = 192.168.50.5
dtmfmode=RFC2833
context=from-lync             ; Contexto Lync Server 2010
disallow=all
allow=alaw
allow=ulaw
qualify = yes
transport = tcp,udp

[2001]
type = friend
callerid = Interno Asterisk [2001] ; Caller ID
secret = 2001                  ; Password
host = dynamic
context=from-asterisk         ; Contexto Asterisk
canreinvite = no
nat=yes
:wq
```




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Ejecutamos -> mv extensions.conf extensions.conf.old

```
[root@CentOS asterisk]# mv extensions.conf extensions.conf.old  
[root@CentOS asterisk]#
```

vi extensions.conf

Presionamos [I] – Modo – INSERT – y copiamos las siguientes lineas

[general]

static=yes

writelnprotect=no

[globals]

[default]

[from-lynx] ; Contexto Lync 2010

;Salida internos con comienzan con 2 y tenga 4 digitos - Asterisk

exten => _2XXX,1,Answer()

exten => _2XXX,n,Dial(SIP/\${EXTEN},20,tr)

exten => _2XXX,n,Busy



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[from-asterisk] ; Contexto Asterisk 1.8

; Llamadas a Internos de Lync que empiecen con 1

exten => _1XXX,1,Set(EXT=+\${EXTEN})

exten => _1XXX,1,Answer()

exten => _1XXX,n,Dial(SIP/Trama_Lync/\${EXT},20,tr)

exten => _1XXX,n,Busy

; Interno 2001

exten => 2001,1,Answer()

exten => 2001,n,Dial(SIP/2001,20,tr)

exten => 2001,n,Hangup



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Presionamos -> [ESC], wq! (para guardar el archivo)

```
[general]
static=yes
writeprotect=no

[globals]

[default]
[from-lync]          ; Contexto Lync 2010
;Salida internos con comienzan con 2 y tenga 4 digitos - Asterisk

exten => _2XXX,1,Answer()
exten => _2XXX,n,Dial(SIP/${EXTEN},20,tr)
exten => _2XXX,n,Busy

[from-asterisk]      ; Contexto Asterisk 1.8

; Llamadas a Internos de Lync que empiecen con 1
exten => _1XXX,1,Set(EXT=+${EXTEN})
exten => _1XXX,1,Answer()
exten => _1XXX,n,Dial(SIP/Trama_Lync/${EXT},20,tr)
exten => _1XXX,n,Busy

; Interno 2001
exten => 2001,1,Answer()
exten => 2001,n,Dial(SIP/2001,20,tr)
exten => 2001,n,Hangup

:qw!
```



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Reiniciamos asterisk con el comando → **service asterisk restart**

```
[root@CentOS asterisk]# service asterisk restart
Stopping safe_asterisk:           [ OK ]
Shutting down asterisk:          [ OK ]
Starting asterisk:
[root@CentOS asterisk]#
```

Para realizar la prueba voy a utilizar un SoftPhone X-Lite para el interno Asterisk con la siguiente configuración el password es 2001 el interno lo configuramos antes en sip.conf

Properties of Account1

Account | Voicemail | Topology | Presence | Advanced

User Details

Display Name	2001
User name	2001
Password	••••
Authorization user name	2001
Domain	192.168.50.220





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Para lync utilizamos un cliente nativo con la configuracion del interno como se muestra en la siguiente imagen usuario gsanchez@itsanchez.com.ar interno 1001

Edit Lync Server User - Guillermo Sanchez

 Commit  Cancel

Display name:

☒ Enabled for Lync Server

SIP address:*
 @

Registrar pool:
 ?

Telephony:
 ?

Line URI:
 ?

Dial plan policy:
 View...

Voice policy:
 View...



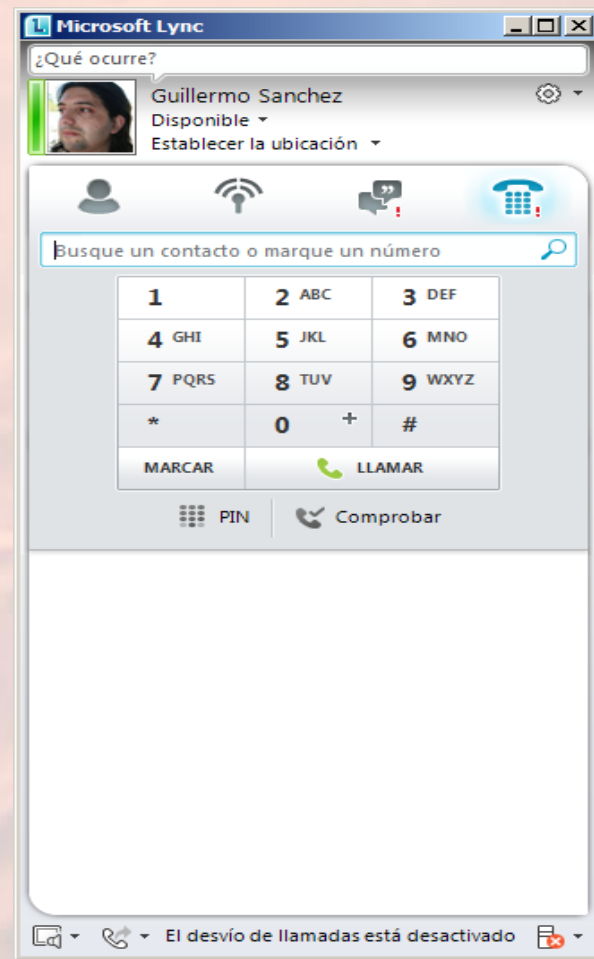
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Vemos como se ven los clientes a utilizar en la prueba



Cliente Asterisk [2001]



Cliente Lync [1001]



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Desde el cliente Asterisk interno 2001 llamamos al interno 1001
[gsanchez@itsanchez.com.ar en lync]

The screenshot shows a Linux desktop environment with a blue background. In the center, there is a virtual mobile phone labeled 'X-Lite' with a screen displaying 'Ringing...' and the number '1001'. To the left, a terminal window titled 'root@CentOS:~ - Xshell 4 (Free for Home/School)' shows a command prompt with the IP address '192.168.50.220:22'. To the right, a Microsoft Lync window is open, showing a contact named 'Guillermo Sanchez' with status 'Disponible'. Below the contact information is a search bar and a numeric keypad. At the bottom right, a Lync status bar shows 'Interno Asterisk [2001]' and 'Otro: 2001'. The system tray at the bottom indicates the time as 18:16 on 03/05/2012.

root@CentOS:~ - Xshell 4 (Free for Home/School)

File Edit View Tools Window Help

New Folder Reconnect

192.168.50.220:22

ack

== Using

== Using

-- C

-- S

-- S

-- M

-- E

== Spa

== Usin

== Usir

-- Ex

-- Ex

ack

== Usin

== Usin

-- Ca

-- SI

-- SI

-- SI

CentOS+CL

Connected to

PDF

Asterisk

Microsoft_P...

_enu_1... 0000032B1...

Microsoft Lync

¿Qué ocurre?

Guillermo Sanchez

Disponible

Establecer la ubicación

Busque un contacto o marque un número

1	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PQRS	8 TUV	9 WXYZ
*	0 +	#

MARCAR LLAMAR

PIN Comprobar

Interno Asterisk [2001]

Otro: 2001

Redirigir Rechazar

ES

18:16

03/05/2012



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Desde el cliente de Lync gsanchez@itsanchez.com.ar interno 1001 llamamos al interno 2001 en Astersik





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Por ultimo vemos el log generado en Asterisk de la llamada desde Asterisk a Lync y viceversa

Llamada interno 2001 a 1001 [Asterisk – Lync]

```
-- Executing [1001@from-asterisk:3] Busy("SIP/2001-00000000", "") in new stack
== Spawn extension (from-asterisk, 1001, 3) exited non-zero on 'SIP/2001-00000000'
== Using UDPTL CoS mark 5
== Using SIP RTP CoS mark 5
-- Executing [1001@from-asterisk:1] Set("SIP/2001-00000002", "EXT+=1001") in new stack
-- Executing [1001@from-asterisk:2] Dial("SIP/2001-00000002", "SIP/Trama Lync/+1001,20,tr") in new stack
```

Llamada de interno 1001 a 2001 [Lync – Asterisk]

```
-- Executing [2001@from-lync:1] Answer("SIP/Trama Lync-00000004", "") in new stack
-- Executing [2001@from-lync:2] Dial("SIP/Trama Lync-00000004", "SIP/2001,20,tr") in new stack
== Using UDPTL CoS mark 5
== Using SIP RTP CoS mark 5
-- Called SIP/2001
-- SIP/2001-00000005 is ringing
-- SIP/2001-00000005 is ringing
-- SIP/2001-00000005 answered SIP/Trama_Lync-00000004
== Spawn extension (from-lync, 2001, 2) exited non-zero on 'SIP/Trama_Lync-00000004'
```

El resto queda libre a su imaginación, saludos!