



CenturyLink SIP Trunking: Connecting Cisco Unified Communications Manager 8.6.1 via the Cisco Unified Border Element 8.6 using SIP

March 22, 2013

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Introduction

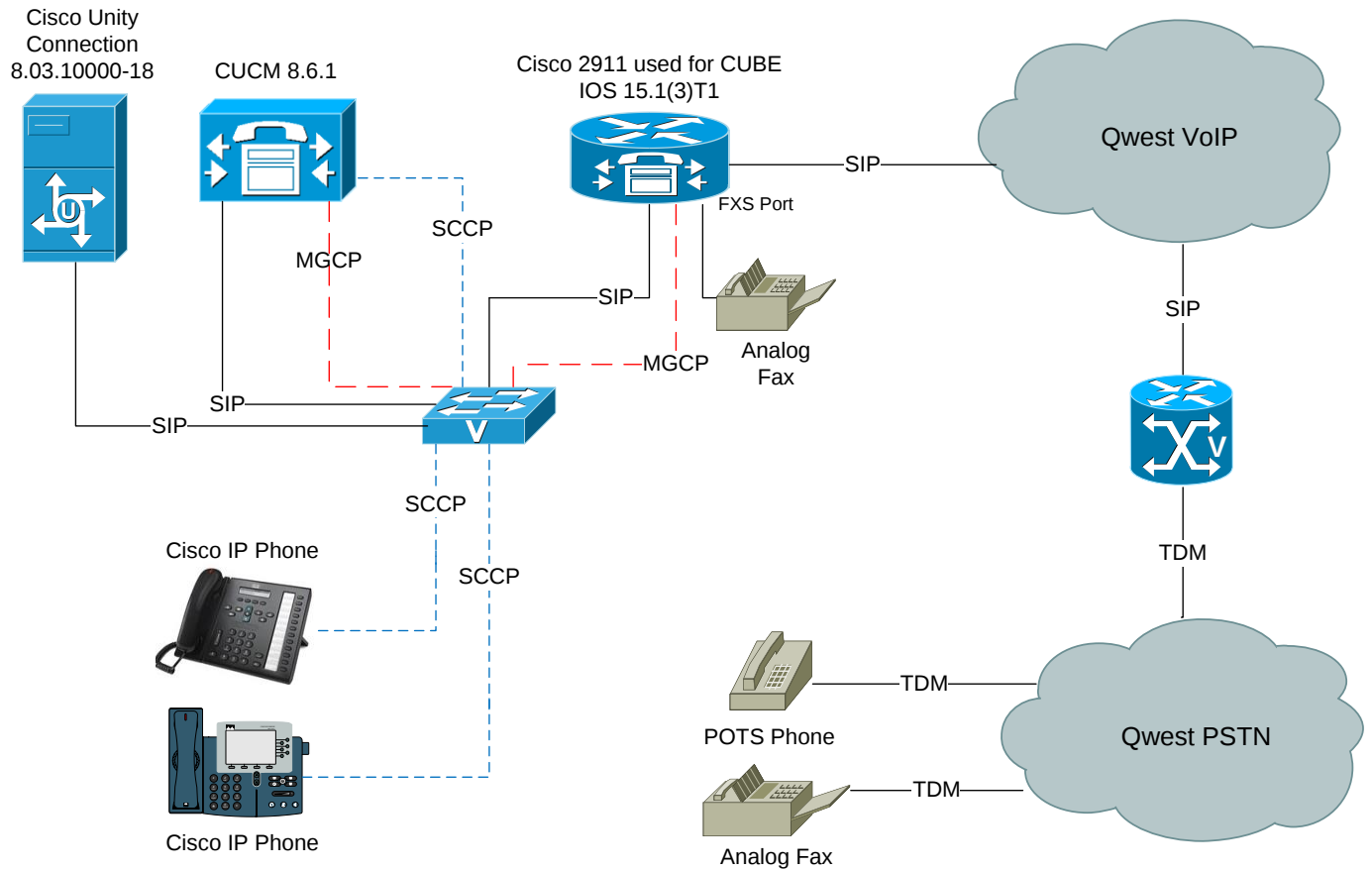
Service Providers today, such as CenturyLink Communications, are offering alternative methods to connect to the PSTN via their IP network. Most of these services utilize SIP as the primary signaling method and a centralized IP to TDM gateway to provide on-net and off-net services. CenturyLink Communications SIP Trunking is a service provider offering that allows connection to the PSTN and may offer the end customer a viable alternative to traditional PSTN connectivity via either Analog or T1 lines. A demarcation device between these services and customer owned services is recommended. The Cisco Unified Border Element provides demarcation, security, interworking and session management services.

- This application note describes how to configure a Cisco Unified Communications Manager (Cisco UCM) 8.6.1 with a Cisco Unified Border Element 8.6 (Cisco UBE) for connectivity to CenturyLink Communications SIP trunk service. The deployment model covered in this application note is CPE (Cisco UCM 8.6.1/Cisco UBE) to PSTN via CenturyLink SIP Trunking. This document does not address 911 emergency outbound calls. For 911 feature service details contact CenturyLink Communications, directly.
- Testing was performed in accordance to CenturyLink SIP Trunk interoperability Test Plan and all features were verified. Key features verified are:
 - Basic Calls
 - Basic Calls with Calling Name and Number as allowed or restricted
 - DTMF Relay – RFC 2833
 - Call Conference (Intra-site, PSTN)
 - Call Transfer (Blind, Attended, Early Attended)
 - Hold and Resume
 - Voice Mail
 - T.38 Fax
 - Simultaneous Calls
 - International Calls
 - Call Forwarding (Unconditional, Busy, No Reply)
 - Codec negotiation
 - Dial Plans
- The Cisco Unified Border Element configuration detailed in this document is based on a lab environment with a simple dial-plan used to ensure proper interoperability between CenturyLink Communications SIP network and Cisco Unified Communications. The configuration described in this document details the important commands to have enabled for interoperability to be successful and care must be taken, by the network administrator deploying Cisco UBE, to ensure these commands are set per each dial-peer requiring to interoperate to CenturyLink Communications SIP network.
- This application note does not cover the use of calling search spaces (CSS) or partitions on Cisco Unified Communications Manager. To understand and learn how to apply CSS and partitions refer to the cisco.com link below:
http://www.cisco.com/en/US/partner/docs/voice_ip_comm/cucm/admin/8_0_2/ccmsys/a03ptcss.html



Network Topology

Figure 1. Lab Network Topology





System Components

Hardware Components

- Cisco 2911 with VIC3 – 4FXS/DID (Used as Cisco Unified Border Element and MGCP gateway for FXS)
- Cisco Unified Communications Manager (Cisco MCS 7800 Series server)
- Cisco Unity Connection (Cisco MCS 7800 Series server)
- Cisco IP Phones (SCCP)

Software Requirements

- Cisco Unified Border Element Release **8.6** with IOS version 15.1(3)T1. This configuration was tested with flash:c2900-universalk9-mz.SPA.151-3.T1.bin
- Cisco Unified Communications Manager Release 8.6.1. This solution was tested with 8.6.1.20000-1
- Cisco Unity Connection Release 8.6.1. This solution was tested with 8.0.3.10000-8

Features

Features Supported

- Voice calls using G.729 and G.711 codecs
- RFC 2833
- RFC 3261
- Calling number presentation / restriction
- Call conferencing
- Call transfer (attended and unattended)
- Call hold and resume
- Call forwarding
- T.38 fax

Features Not Supported

- SIP REFER
- MGCP based T.38 Fallback to pass-through

Caveats

- Although CenturyLink SIP Trunking supports SIP REFER the Cisco UCM will only accept REFER messages, it will not generate them.
- MGCP based fax calls set up as G.729 will not Fallback to pass-through.
- Could not configure the CUCM MGCP gateway to remove T38, therefore no G711 fax passthru testing was performed.



CUBE Configuration

Critical commands are marked in **Red** with footnotes at the bottom of the page

Version Information:

Cisco IOS Software, C2900 Software (C2900-UNIVERSALK9-M), Version 15.1(3)T1, RELEASE SOFTWARE (fc2)
Technical Support: <http://www.cisco.com/techsupport>
Copyright (c) 1986-2011 by Cisco Systems, Inc.
Compiled Sun 27-Mar-11 07:36 by prod_rel_team

ROM: System Bootstrap, Version 15.0(1r)M6, RELEASE SOFTWARE (fc1)

CCM_CUBE uptime is 1 week, 3 days, 17 hours, 47 minutes
System returned to ROM by reload at 20:21:45 UTC Thu Sep 8 2011
System image file is "flash:c2900-universalk9-mz.SPA.151-3.T1.bin"
Last reload type: Normal Reload
Last reload reason: Reload Command

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
<http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to export@cisco.com.

Cisco CISCO2911/K9 (revision 1.0) with 479232K/45056K bytes of memory.
Processor board ID FTX1435A0RR
3 Gigabit Ethernet interfaces
1 Serial interface
1 Channelized T1/PRI port
4 Voice FXS interfaces
DRAM configuration is 64 bits wide with parity enabled.
255K bytes of non-volatile configuration memory.
250880K bytes of ATA System CompactFlash 0 (Read/Write)

License Info:

License UDI:

Device# PID SN

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



*0 CISCO2911/K9 FTX1435A0RR

Technology Package License Information for Module:'c2900'

Technology	Technology-package Current	Type	Technology-package Next reboot
ipbase	ipbasek9	Permanent	ipbasek9
security	None	None	None
uc	uck9	Permanent	uck9
data	None	None	None

Configuration register is 0x2102

Running Configuration:

```
Current configuration : 9182 bytes
!
! Last configuration change at 22:14:12 UTC Thu Apr 14 2011
!
version 15.1
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname CCM_CUBE
!
boot-start-marker
boot-end-marker
!
card type t1 0 0
no logging queue-limit
logging buffered 2000000
no logging rate-limit
enable password 7 15031C09403E
!
no aaa new-model
no network-clock-participate wic 0
!
no ipv6 cef
ip source-route
ip cef
!
!
!
ip domain name yourdomain.com
multilink bundle-name authenticated
!
crypto pki token default removal timeout 0
!
!
```

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



```
crypto pki trustpoint TP-self-signed-1820344965
enrollment selfsigned
subject-name cn=IOS-Self-Signed-Certificate-1820344965
revocation-check none
rsakeypair TP-self-signed-1820344965
!
!
crypto pki certificate chain TP-self-signed-1820344965
certificate self-signed 01
3082024F 308201B8 A0030201 02020101 300D0609 2A864886 F70D0101 04050030
31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D 43657274
69666963 6174652D 31383230 33343439 3635301E 170D3131 30323137 31373336
35335A17 0D323030 31303130 30303030 305A3031 312F302D 06035504 03132649
4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D31 38323033
34343936 3530819F 300D0609 2A864886 F70D0101 01050003 818D0030 81890281
8100A0D8 21F09B1B E40B5BA2 D3EC3DB5 1DC9C070 619EF9B3 2E6EFCC1 669A155F
475AE5A7 E97A9A3D BCC38882 30D0AE65 899995EC 20C8D67A DFD1E644 04B01DBD
446B8455 16C324D4 7604C3F0 D7C82295 7E2B26B5 1B8A76FB 5A384714 09EC65B0
5D7071FB EFF12B32 8F3E0387 835633F1 BA40509D BD99D6A7 5EE5BE15 6528D39A
04CB0203 010001A3 77307530 0F060355 1D130101 FF040530 030101FF 30220603
551D1104 1B301982 1743434D 5F435542 452E796F 7572646F 6D61696E 2E636F6D
301F0603 551D2304 18301680 143F4EF3 7A764FE1 75D76581 3D5C2D45 A19227C5
E1301D06 03551D0E 04160414 3F4EF37A 764FE175 D765813D 5C2D45A1 9227C5E1
300D0609 2A864886 F70D0101 04050003 8181008F B7A72275 B2766112 2A960B11
988BE4FF 988CAC02 721EEDA4 14280F66 324C0330 F36563B0 8689B11E DA9803C7
07384408 E625B1D2 C4802EAF 6F34950F A8D9F26D C8F5096C 7C855579 C5794AE3
FDEA7F9C 7D49FD36 DA886764 F1A42FA2 6F65F046 4100CB3A 9C143990 0D413F72
17D7CA57 FE2100A7 5EA72AF7 04AD0386 FF6DAB
!
!
voice-card 0
dspfarm
dsp services dspfarm
!
!
voice service voip
address-hiding
allow-connections sip to sip
no supplementary-service sip moved-temporarily
fax protocol t38 version 0 ls-redundancy 0 hs-redundancy 0 fallback none
no fax-relay sg3-to-g3
sip
bind control source-interface Loopback0
bind media source-interface Loopback0
asserted-id pai1
midcall-signaling passthru2
privacy-policy passthru3
pass-thru content unsupp
pass-thru content sdp4
```

¹ Added so the Cisco UBE did not strip the PAI from the Cisco UCM

² Required for MOH and offnet transfer

³ Added so the Cisco UBE would not change received privacy indicator

⁴ Required to utilize Cisco UCM early offer / codec negotiation between CUCM and CenturyLink (Will break MVA if VXML is collocated on the same router)



```
voice class sip-profiles 15
request INVITE sip-header Diversion modify "[^ ]+(127@)" "<sip:6143568\1"
request INVITE sip-header Diversion modify "[^ ]+(1[3,4][1-9]@)" "<sip:7202839\1"
!
!
!
voice translation-rule 1
rule 1 /^1\(.*)/ ^1/
!
voice translation-rule 3
rule 1 /.*(...)/ ^1/
!
voice translation-rule 9
rule 2 /^9\(.*)/ ^1/
!
voice translation-rule 10
rule 1 /.*(.....)/ ^1/
!
!
voice translation-profile DIGITSTRIP-1
translate called 1
!
voice translation-profile DIGITSTRIP-9
translate called 9
!
voice translation-profile Last10
translate called 10
!
voice translation-profile Last3
translate called 3
!
!
!
application
!
!
!
license udi pid CISCO2911/K9 sn FTX1435A0RR
hw-module pvdm 0/0
!
!
!
username CenturyLink password 7 0518165E331D5A
username cisco privilege 15 secret 5 $1$kuyq$NqXV4Kd3/zsik6/opnU/5/
!
redundancy
!
!
controller T1 0/0/0
cablelength long 0db
channel-group 0 timeslots 1-24
!
interface Loopback0
```

⁵ Required for offnet call forwarding / single number reach if Cisco UCM dial plan is < 10 digits. The example is for a 3 digit dial plan



```
ip address 10.182.0.218 255.255.255.252
!
interface GigabitEthernet0/0
no ip address
duplex auto
speed auto
!
interface GigabitEthernet0/0.100
description LAN Switch
encapsulation dot1Q 100
ip address 10.1.1.1 255.255.255.0
ip virtual-reassembly
!
interface GigabitEthernet0/1
no ip address
shutdown
duplex auto
speed auto
!
interface GigabitEthernet0/2
no ip address
shutdown
duplex auto
speed auto
!
interface Serial0/0/0:0
description WAN
ip address 65.113.26.242 255.255.255.252
ip virtual-reassembly
encapsulation ppp
!
ip forward-protocol nd
!
ip http server
ip http access-class 23
ip http authentication local
ip http secure-server
ip http timeout-policy idle 60 life 86400 requests 10000
!
!
control-plane
!
!
voice-port 0/1/0
description Fax
timeouts ringing infinity
caller-id enable
!
voice-port 0/1/1
!
voice-port 0/1/2
!
voice-port 0/1/3
!

ccm-manager mgcp
```



```
no ccm-manager fax protocol cisco
ccm-manager config server 10.1.1.2
!
mgcp
mgcp call-agent 10.1.1.2 service-type mgcp version 0.1
mgcp dtmf-relay voip codec all mode nte-ca
mgcp package-capability rtp-package
mgcp package-capability sst-package
mgcp package-capability pre-package
mgcp package-capability fm-package
mgcp default-package fxr-package
no mgcp package-capability res-package
no mgcp timer receive-rtcp
mgcp sdp simple
mgcp fax rate 14400
mgcp fax t38 ls_redundancy 1
mgcp fax t38 hs_redundancy 1
no mgcp fax-relay sg3-to-g3
mgcp bind control source-interface GigabitEthernet0/0.100
mgcp bind media source-interface GigabitEthernet0/0.100
!
mgcp profile default
!
!
dial-peer voice 101 voip
preference 1
destination-pattern ^72028391[3-4][1-9]
session protocol sipv2
session target ipv4:10.1.1.2
session transport udp
dtmf-relay rtp-nte
no vad
!
dial-peer voice 201 voip
translation-profile outgoing Last10
preference 1
destination-pattern ^1[1-9].....
session protocol sipv2
session target ipv4:10.182.0.24
session transport udp
voice-class sip profiles 1
dtmf-relay rtp-nte
no vad
!
dial-peer voice 102 voip
preference 1
destination-pattern ^6143568127
session protocol sipv2
session target ipv4:10.1.1.2
session transport udp
dtmf-relay rtp-nte
no vad
!
```



```
dial-peer voice 301 voip
translation-profile outgoing Last10
preference 2
destination-pattern ^1[1-9].....
session protocol sipv2
session target ipv4:10.182.3.24
session transport udp
voice-class sip profiles 1
dtmf-relay rtp-nte
no vad
!
dial-peer voice 202 voip
translation-profile outgoing Last3
preference 1
destination-pattern ^1[4,7,9]11
session protocol sipv2
session target ipv4:10.182.0.24
session transport udp
voice-class sip profiles 1
dtmf-relay rtp-nte
no vad
!
dial-peer voice 203 voip
translation-profile outgoing DIGITSTRIP-1
preference 1
destination-pattern ^1011.+
session protocol sipv2
session target ipv4:10.182.0.24
session transport udp
voice-class sip profiles 1
dtmf-relay rtp-nte
no vad
!
dial-peer voice 302 voip
translation-profile outgoing DIGITSTRIP-1
preference 2
destination-pattern ^1011.+
session protocol sipv2
session target ipv4:10.182.3.24
session transport udp
voice-class sip profiles 1
dtmf-relay rtp-nte
no vad
!
dial-peer voice 303 voip
translation-profile outgoing Last3
preference 2
destination-pattern ^1[4,7,9]11
session protocol sipv2
session target ipv4:10.182.3.24
session transport udp
voice-class sip profiles 1
dtmf-relay rtp-nte
no vad
!
dial-peer voice 204 voip
```



```
translation-profile outgoing DIGITSTRIP-1
preference 1
destination-pattern ^10+
session protocol sipv2
session target ipv4:10.182.0.24
session transport udp
voice-class sip pass-thru content sdp
dtmf-relay rtp-nte
no vad
!
dial-peer voice 205 voip
translation-profile outgoing DIGITSTRIP-1
preference 1
destination-pattern ^15551212
session protocol sipv2
session target ipv4:10.182.0.24
session transport udp
voice-class sip pass-thru content sdp
dtmf-relay rtp-nte
no vad
!
dial-peer voice 304 voip
translation-profile outgoing DIGITSTRIP-1
preference 2
destination-pattern ^10+
session protocol sipv2
session target ipv4:10.182.3.24
session transport udp
voice-class sip pass-thru content sdp
dtmf-relay rtp-nte
no vad
!
dial-peer voice 305 voip
translation-profile outgoing DIGITSTRIP-1
preference 2
destination-pattern ^15551212
session protocol sipv2
session target ipv4:10.182.3.24
session transport udp
voice-class sip pass-thru content sdp
dtmf-relay rtp-nte
no vad
!
dial-peer voice 10 pots
preference 1
service mgcpapp
port 0/1/0
!
!
gateway
timer receive-rtp 1200
!
```

sip-ua



```
retry invite 36
!
!
!
gatekeeper
shutdown
!
!
line con 0
session-timeout 60
exec-timeout 30 0
session-disconnect-warning 59
login local
line aux 0
line vty 0 4
access-class 23 in
exec-timeout 30 0
privilege level 15
login local
transport input telnet ssh
line vty 5 15
access-class 23 in
privilege level 15
login local
transport input telnet ssh
!
scheduler allocate 20000 1000
```

⁶ Required for SIP Trunk diversity / fail over to alternate SIP trunk on time outs



Cisco Unified Communications Manager Configuration

CUCM Version

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration

Search Documentation | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Cisco Unified CM Administration
System version: 8.6.1.20000-1 Unrestricted

Please visit the [License Report Page](#) for more details.

Last Successful Logon: Sep 15, 2011 12:04:19 PM
Failed Logon Attempts 1

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For information about Cisco Unified Communications Manager please visit our [Unified Communications System Documentation](#) web site.

For Cisco Technical Support please visit our [Technical Support](#) web site.



Route Plan Report

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For Cisco Unified Communications Solutions				
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Find and List Route Plan Report				
Related Links: View in file				
Status				
24 records found				
Find and List Route Plan Report (1 - 24 of 24) Rows per Page 50				
Find All Patterns Find and List Route Plan Report where Pattern/Directory Number begins with Find Select item or enter search text				
	Pattern/Directory Number ^	Partition	Type	Route Detail
		Generated_Everyone	Message Waiting	
		Generated_Everyone	Message Waiting	
	0	Generated_Everyone	Route Pattern	c2911_CUBE
	00	Generated_Everyone	Route Pattern	c2911_CUBE
	127	Generated_Everyone	Directory Number	SEP0022905AA6AB
	137	Generated_Everyone	Directory Number	SEP0026CBA82B7B
	137	Generated_Everyone	Directory Number	SEP0026CBA82B7B
	137	Generated_Managers	Directory Number	SEP0026CBA82B7B
	138	Generated_Everyone	Directory Number	SEP001121FFEC6E
	139	Generated_Everyone	Directory Number	SEP0026CBA82B9F
	140	Generated_Everyone	Conference	
	141	Generated_Everyone	Voice Mail Port	CiscoUM1-VI1
	143	Generated_Everyone	Directory Number	AALN/S0/SU1/0@CCM_CUBE.yourdomain.com
	145	Generated_Everyone	Voice Mail Port	CiscoUM1-VI2
	222	Generated_Everyone	Hunt Pilot	CUCMVM CUCMVM 141, Generated_Everyone 145, Generated_Everyone
	9*67.@	Generated_Everyone	Route Pattern	c2911_CUBE
	9.00X+	Generated_Everyone	Route Pattern	c2911_CUBE
	9.5551212	Generated_Everyone	Route Pattern	c2911_CUBE
	9.@	Generated_Everyone	Route Pattern	c2911_CUBE
	9.X11	Generated_Everyone	Route Pattern	c2911_CUBE
	9.XXX5551212	Generated_Everyone	Route Pattern	c2911_CUBE
	XXXXX	Generated_Route_Point	Directory Number	Assistant_RP

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



Route Patterns

Cisco Unified CM Administration
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Find and List Route Patterns

[+](#) Add New [Select All](#) [Clear All](#) [Delete Selected](#)

Status
 8 records found

Route Patterns (1 - 8 of 8) Rows per Page 50

Find Route Patterns where Pattern ▾ begins with ▾ Find Clear Filter [+](#) [-](#)

☐	Pattern ^	Description	Partition	Route Filter	Associated Device	Copy
☐	0		Generated Everyone		c2911 CUBE	
☐	00		Generated Everyone		c2911 CUBE	
☐	9*67.@		Generated Everyone		c2911 CUBE	
☐	9.00X+		Generated Everyone		c2911 CUBE	
☐	9.5551212		Generated Everyone		c2911 CUBE	
☐	9.@		Generated Everyone		c2911 CUBE	
☐	9.X11		Generated Everyone		c2911 CUBE	
☐	9.XXX5551212		Generated Everyone		c2911 CUBE	

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



Route Pattern 0

Cisco Unified CM Administration
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Navigation Cisco Unified CM Administration G

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System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Route Pattern Configuration Related Links: Back To Find/List G

Save Delete Copy Add New

Status
Status: Ready

Pattern Definition
Route Pattern* 0
Route Partition Generated_Everyone
Description
Numbering Plan -- Not Selected --
Route Filter < None >
MLPP Precedence* Default
☐ Apply Call Blocking Percentage
Resource Priority Namespace Network Domain < None >
Route Class* Default
Gateway/Route List* c2911_CUBE (Edit)
Route Option
☒ Route this pattern
☐ Block this pattern No Error
Call Classification* OnNet
☐ Allow Device Override ☐ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority
☐ Require Forced Authorization Code
Authorization Level* 0
☐ Require Client Matter Code

Calling Party Transformations
☒ Use Calling Party's External Phone Number Mask
Calling Party Transform Mask
Prefix Digits (Outgoing Calls)
Calling Line ID Presentation* Default
Calling Name Presentation* Default
Calling Party Number Type* Cisco CallManager
Calling Party Numbering Plan* Cisco CallManager

Connected Party Transformations
Connected Line ID Presentation* Default
Connected Name Presentation* Default

Called Party Transformations
Discard Digits < None >
Called Party Transform Mask
Prefix Digits (Outgoing Calls) 1
Called Party Number Type* Cisco CallManager
Called Party Numbering Plan* Cisco CallManager

ISDN Network-Specific Facilities Information Element
Network Service Protocol -- Not Selected --
Carrier Identification Code
Network Service Service Parameter Name Service Parameter Value
-- Not Selected -- < Not Exist >

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Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



Route Pattern 00

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Route Pattern Configuration Related Links: Back To Find/List

Save Delete Copy Add New

Status
Status: Ready

Pattern Definition
Route Pattern* 00
Route Partition Generated_Everyone
Description
Numbering Plan -- Not Selected --
Route Filter < None >
MLPP Precedence* Default
☐ Apply Call Blocking Percentage
Resource Priority Namespace Network Domain < None >
Route Class* Default
Gateway/Route List* c2911_CUBE (Edit)
Route Option
☒ Route this pattern
☐ Block this pattern No Error
Call Classification* OnNet
☐ Allow Device Override ☐ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority
☐ Require Forced Authorization Code
Authorization Level* 0
☐ Require Client Matter Code

Calling Party Transformations
☒ Use Calling Party's External Phone Number Mask
Calling Party Transform Mask
Prefix Digits (Outgoing Calls)
Calling Line ID Presentation* Default
Calling Name Presentation* Default
Calling Party Number Type* Cisco CallManager
Calling Party Numbering Plan* Cisco CallManager

Connected Party Transformations
Connected Line ID Presentation* Default
Connected Name Presentation* Default

Called Party Transformations
Discard Digits < None >
Called Party Transform Mask
Prefix Digits (Outgoing Calls) 1
Called Party Number Type* Cisco CallManager
Called Party Numbering Plan* Cisco CallManager

ISDN Network-Specific Facilities Information Element
Network Service Protocol -- Not Selected --
Carrier Identification Code
Network Service Service Parameter Name Service Parameter Value
-- Not Selected -- < Not Exist >

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Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



Route Pattern 9*67.@

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Route Pattern Configuration Related Links: Back To Find/List

Save Delete Copy Add New

Status
Status: Ready

Pattern Definition

Route Pattern*: 9*67.@
Route Partition: Generated_Everyone
Description:
Numbering Plan*: NANP
Route Filter: < None >
MLPP Precedence*: Default
Resource Priority Namespace Network Domain: < None >
Route Class*: Default
Gateway/Route List*: c2911_CUBE (Edit)
Route Option:
☒ Route this pattern
☐ Block this pattern No Error
Call Classification*: OffNet
☐ Allow Device Override ☒ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority
☐ Require Forced Authorization Code
Authorization Level*: 0
☐ Require Client Matter Code

Calling Party Transformations

☒ Use Calling Party's External Phone Number Mask
Calling Party Transform Mask:
Prefix Digits (Outgoing Calls):
Calling Line ID Presentation*: Restricted
Calling Name Presentation*: Restricted
Calling Party Number Type*: Cisco CallManager
Calling Party Numbering Plan*: Cisco CallManager

Connected Party Transformations

Connected Line ID Presentation*: Default
Connected Name Presentation*: Default

Called Party Transformations

Discard Digits: PreAt
Called Party Transform Mask:
Prefix Digits (Outgoing Calls): 1
Called Party Number Type*: Cisco CallManager
Called Party Numbering Plan*: Cisco CallManager

ISDN Network-Specific Facilities Information Element

Network Service Protocol: -- Not Selected --
Carrier Identification Code:
Network Service: -- Not Selected -- Service Parameter Name: < Not Exist > Service Parameter Value:

This route pattern is used for caller ID blocking

Strips route pattern adds prefix digit 1 to for CUBE dial peers

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



Route Pattern 9.00X+

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Route Pattern Configuration

Related Links: Back To Find/List

Save Delete Copy Add New

Status

Status: Ready

Pattern Definition

Route Pattern*

9.00X+

Route Partition

Generated_Everyone

Description

Numbering Plan*

NANP

Route Filter

< None >

MLPP Precedence*

Default

☐ Apply Call Blocking Percentage

Resource Priority Namespace Network Domain

< None >

Route Class*

Default

Gateway/Route List*

c2911_CUBE

(Edit)

Route Option

☒ Route this pattern

☐ Block this pattern

No Error

Call Classification*

OffNet

☐ Allow Device Override

☒ Provide Outside Dial Tone

☐ Allow Overlap Sending

☐ Urgent Priority

☐ Require Forced Authorization Code

Authorization Level*

0

☐ Require Client Matter Code

Calling Party Transformations

☒ Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation*

Default

Calling Name Presentation*

Default

Calling Party Number Type*

Cisco CallManager

Calling Party Numbering Plan*

Cisco CallManager

Connected Party Transformations

Connected Line ID Presentation*

Default

Connected Name Presentation*

Default

Called Party Transformations

☐ Discard Digits

PreAt

Called Party Transform Mask

Prefix Digits (Outgoing Calls)

1

Called Party Number Type*

Cisco CallManager

Called Party Numbering Plan*

Cisco CallManager

ISDN Network-Specific Facilities Information Element

Network Service Protocol

-- Not Selected --

Carrier Identification Code

Network Service

-- Not Selected --

Service Parameter Name

< Not Exist >

Service Parameter Value

Strips route pattern adds prefix digit 1 to for CUBE dial peers

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



Route Pattern 9.5551212

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Save Delete Copy Add New

Status
Status: Ready

Pattern Definition

Route Pattern* 9.5551212

Route Partition Generated_Everyone

Description

Numbering Plan* NANP

Route Filter < None >

MLPP Precedence* Default

☐ Apply Call Blocking Percentage

Resource Priority Namespace Network Domain < None >

Route Class* Default

Gateway/Route List* c2911_CUBE (Edit)

Route Option
☒ Route this pattern
☐ Block this pattern No Error

Call Classification* OffNet

☐ Allow Device Override ☒ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority

☐ Require Forced Authorization Code

Authorization Level* 0

☐ Require Client Matter Code

Calling Party Transformations

☒ Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation* Default

Calling Name Presentation* Default

Calling Party Number Type* Cisco CallManager

Calling Party Numbering Plan* Cisco CallManager

Connected Party Transformations

Connected Line ID Presentation* Default

Connected Name Presentation* Default

Called Party Transformations

Discard Digits PreAt

Called Party Transform Mask

Prefix Digits (Outgoing Calls) 1

Called Party Number Type* Cisco CallManager

Called Party Numbering Plan* Cisco CallManager

ISDN Network-Specific Facilities Information Element

Network Service Protocol -- Not Selected --

Carrier Identification Code

Network Service -- Not Selected -- Service Parameter Name < Not Exist > Service Parameter Value

Strips route pattern adds prefix digit 1 to for CUBE dial peers

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



Route Pattern 9.@

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Route Pattern Configuration Related Links: Back To Find/List

Save Delete Copy Add New

Status
Status: Ready

Pattern Definition

Route Pattern*: 9.@
Route Partition: Generated_Everyone
Description:
Numbering Plan*: NANP
Route Filter: < None >
MLPP Precedence*: Default
Resource Priority Namespace Network Domain: < None >
Route Class*: Default
Gateway/Route List*: c2911_CUBE (Edit)
Route Option:
☒ Route this pattern
☐ Block this pattern No Error
Call Classification*: OffNet
☐ Allow Device Override ☒ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority
☐ Require Forced Authorization Code
Authorization Level*: 0
☐ Require Client Matter Code

Calling Party Transformations

☒ Use Calling Party's External Phone Number Mask
Calling Party Transform Mask:
Prefix Digits (Outgoing Calls):
Calling Line ID Presentation*: Default
Calling Name Presentation*: Default
Calling Party Number Type*: Cisco CallManager
Calling Party Numbering Plan*: Cisco CallManager

Connected Party Transformations

Connected Line ID Presentation*: Default
Connected Name Presentation*: Default

Called Party Transformations

Discard Digits: PreAt
Called Party Transform Mask:
Prefix Digits (Outgoing Calls): 1
Called Party Number Type*: Cisco CallManager
Called Party Numbering Plan*: Cisco CallManager

ISDN Network-Specific Facilities Information Element

Network Service Protocol: -- Not Selected --
Carrier Identification Code:
Network Service: -- Not Selected -- Service Parameter Name: < Not Exist > Service Parameter Value:

Strips route pattern adds prefix digit 1 to for CUBE dial peers

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



Route Pattern 9.X11

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Route Pattern Configuration

Related Links: Back To Find/List

Save Delete Copy Add New

Status
Status: Ready

Pattern Definition

Route Pattern* 9.X11

Route Partition Generated_Everyone

Description

Numbering Plan* NANP

Route Filter < None >

MLPP Precedence* Default

☐ Apply Call Blocking Percentage

Resource Priority Namespace Network Domain < None >

Route Class* Default

Gateway/Route List* c2911_CUBE (Edit)

Route Option
☒ Route this pattern
☐ Block this pattern No Error

Call Classification* OffNet

☐ Allow Device Override ☒ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority

☐ Require Forced Authorization Code

Authorization Level* 0

☐ Require Client Matter Code

Calling Party Transformations

☒ Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation* Default

Calling Name Presentation* Default

Calling Party Number Type* Cisco CallManager

Calling Party Numbering Plan* Cisco CallManager

Connected Party Transformations

Connected Line ID Presentation* Default

Connected Name Presentation* Default

Called Party Transformations

Discard Digits PreAt

Called Party Transform Mask

Prefix Digits (Outgoing Calls) 1

Called Party Number Type* Cisco CallManager

Called Party Numbering Plan* Cisco CallManager

ISDN Network-Specific Facilities Information Element

Network Service Protocol -- Not Selected --

Carrier Identification Code

Network Service	Service Parameter Name	Service Parameter Value
-- Not Selected --	< Not Exist >	

Strips route pattern adds prefix digit 1 to for CUBE dial peers

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



Route Pattern 9.XXX5551212

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Save Delete Copy Add New

Status
Status: Ready

Pattern Definition

Route Pattern* 9.XXX5551212

Route Partition Generated_Everyone

Description

Numbering Plan* NANP

Route Filter < None >

MLPP Precedence* Default

☐ Apply Call Blocking Percentage

Resource Priority Namespace Network Domain < None >

Route Class* Default

Gateway/Route List* c2911_CUBE (Edit)

Route Option
☒ Route this pattern
☐ Block this pattern No Error

Call Classification* OffNet

☐ Allow Device Override ☒ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority

☐ Require Forced Authorization Code

Authorization Level* 0

☐ Require Client Matter Code

Calling Party Transformations

☒ Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation* Default

Calling Name Presentation* Default

Calling Party Number Type* Cisco CallManager

Calling Party Numbering Plan* Cisco CallManager

Connected Party Transformations

Connected Line ID Presentation* Default

Connected Name Presentation* Default

Called Party Transformations

Discard Digits PreAt

Called Party Transform Mask

Prefix Digits (Outgoing Calls) 1

Called Party Number Type* Cisco CallManager

Called Party Numbering Plan* Cisco CallManager

ISDN Network-Specific Facilities Information Element

Network Service Protocol -- Not Selected --

Carrier Identification Code

Network Service -- Not Selected -- Service Parameter Name < Not Exist > Service Parameter Value

Strips route pattern adds prefix digit 1 to for CUBE dial peers

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



MGCP Gateway

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Gateway Configuration Related Links: Back To Find/List

Save Delete Reset Apply Config Add New

Status
Status: Ready

Gateway Details
Product Cisco 2911
Gateway CCM_CUBE.yourdomain.com
Protocol MGCP
⚠ Device is not trusted
Domain Name* CCM_CUBE.yourdomain.com
Description 2911-UBE
Cisco Unified Communications Manager Group* Default

Configured Slots, VICs and Endpoints
Module in Slot 0 NM-4VWIC-MBRD
Subunit 0 < None >
Subunit 1 VIC3-4FXS/DID 0/1/0 0/1/1 0/1/2 0/1/3
Subunit 2 < None >
Subunit 3 < None >
Module in Slot 1 < None >

Product Specific Configuration Layout
Global ISDN Switch Type 4ESS
Switchback Timing* Never
Switchback uptime-delay (min) 10
Switchback schedule (hh:mm) 12:00
Type Of DTMF Relay* NTE-CA
Modem Passthrough* Enable
Cisco Fax Relay* Disable
T38 Fax Relay* Enable
RTP Package Capability* Enable
MT Package Capability* Disable
RES Package Capability* Disable
PRE Package Capability* Enable
SST Package Capability* Enable
RTP Unreachable OnOff* Enable
RTP Unreachable timeout (ms)* 1000
RTCP Report Interval (secs)* 0
Simple SDP* Enable

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



MGCP FXS Port

Cisco

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Gateway Configuration Related Links: Back to MGCP Configuration

Save Delete Reset Apply Config Add New

Status

Status: Ready

Directory Number Information

7MS Line [1] - 143 in Generated Everyone

Device Information

Product Cisco MGCP FXS Port

Gateway CCM_CUBE.yourdomain.com

Device Protocol Analog Access

Device is not trusted

Registration Registered with Cisco Unified Communications Manager LTLNCUCM

IP Address 10.1.1.1

End-Point Name * AALN/S0/SU1/0@CCM_CUBE.yourdomain.com

Description AALN/S0/SU1/0@CCM_CUBE.yourdomain.com

Device Pool * G729

Common Device Configuration < None >

Media Resource Group List < None >

Packet Capture Mode * None

Packet Capture Duration 0

Calling Search Space Generated_CSS_I_E

AAR Calling Search Space < None >

Location * Hub_None

AAR Group < None >

Location * Hub_None

AAR Group < None >

Network Locale < None >

Use Trusted Relay Point * Default

Geolocation < None >

☐ Transmit UTF-8 for Calling Party Name

Calling Party Transformation CSS < None >

☒ Use Device Pool Calling Party Transformation CSS

☐ Hot line Device

Multilevel Precedence and Preemption (MLPP) Information

MLPP Domain < None >

MLPP Indication Not available on this device

MLPP Preemption Not available on this device

Port Information (Loop Start)

Port Direction * Bothways

Attendant DN * 143

☒ Unattended Port

Product Specific Configuration Layout

Hookflash Timer (50-1550ms) * 50

Inter-digit Duration Timer (50-500 ms) * 100

Input Gain (-6..14 db) * 0

Output Attenuation (-6..14 db) * 3

Echo Cancellation Enable * Enable

Echo Cancellation Coverage (ms) * 64

Ring Number * Default

Impedance * Default GW config

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SIP Trunk

Status
 Status: Ready

Device Information
Product: SIP Trunk
Device Protocol: SIP
Trunk Service Type: None(Default)
Device Name*: c2911_CUBE
Description: SIP Trunk
Device Pool*: SIP Trunk
Common Device Configuration: < None >
Call Classification*: Use System Default
Media Resource Group List: < None >
Location*: Hub_None
AAR Group: < None >
Packet Capture Mode*: None
Packet Capture Duration: 0
☐ Media Termination Point Required
☐ Retry Video Call as Audio
☐ Transmit UTF-8 for Calling Party Name
☒ Unattended Port
☐ SRTP Allowed - When this flag is checked, Encrypted TLS needs to be configured in the network to provide end to end security. Failure to do so will expose keys and other information.
Route Class Signaling Enabled*: Default
Use Trusted Relay Point*: Default
☒ PSTN Access

Intercompany Media Engine (IME)
E.164 Transformation Profile: < None >

Multilevel Precedence and Preemption (MLPP) Information
MLPP Domain: < None >

Call Routing Information
☐ Remote-Party-Id
☒ Asserted-Identity
Asserted-Type*: Default
SIP Privacy*: Default

Inbound Calls
Significant Digits*: 3
Connected Line ID Presentation*: Default
Connected Name Presentation*: Default
Calling Search Space: Generated_CSS_I_E
AAR Calling Search Space: < None >
Prefix DN:
☒ Redirecting Diversion Header Delivery - Inbound

Incoming Calling Party Settings
If the administrator sets the prefix to Default this indicates call processing will use prefix at the next level setting (DevicePool/Service Parameter). Otherwise, the value configured is used as the prefix unless the field is empty in which case there is no prefix assigned.

Clear Prefix Settings Default Prefix Settings

Number Type	Prefix	Strip Digits	Calling Search Space	Use Device Pool CSS
Incoming Number	Default	0	< None >	☒

Connected Party Settings
Connected Party Transformation CSS: < None >
☒ Use Device Pool Connected Party Transformation CSS



Outbound Calls	
Called Party Transformation CSS	< None >
☒ Use Device Pool Called Party Transformation CSS	
Calling Party Transformation CSS	< None >
☒ Use Device Pool Calling Party Transformation CSS	
Calling Party Selection*	Originator
Calling Line ID Presentation*	Default
Calling Name Presentation*	Default
Caller ID DN	
Caller Name	
☒ Redirecting Diversion Header Delivery - Outbound	
Required for offnet call forwarding / single number reach	

SIP Information	
Destination Address	10.182.0.218
Destination Address IPv6	
☐ Destination Address is an SRV	
Destination Port*	5060
MTP Preferred Originating Codec*	G729/G729a
Presence Group*	Standard Presence group
SIP Trunk Security Profile*	Non Secure SIP Trunk Profile
Rerouting Calling Search Space	< None >
Out-Of-Dialog Refer Calling Search Space	< None >
SUBSCRIBE Calling Search Space	< None >
SIP Profile*	SIP Trunk IP Profile
DTMF Signaling Method*	RFC 2833

Geolocation Configuration	
Geolocation	< None >
Geolocation Filter	< None >
☐ Send Geolocation Information	



SIP Profile

SIP Profile Information	
Name*	SIP Trunk IP Profile
Description	Default SIP Profile
Default MTP Telephony Event Payload Type*	101
Resource Priority Namespace List	< None >
Early Offer for G.Clear Calls*	Disabled
SDP Session-level Bandwidth Modifier for Early Offer and Re-invites*	TIAS and AS
User-Agent and Server header information*	Send Unified CM Version Information as User-Ager
☐ Redirect by Application	
☐ Disable Early Media on 180	
☐ Outgoing T.38 INVITE include audio mline	
☐ Enable ANAT	
☐ Require SDP Inactive Exchange for Mid-Call Media Change	
☐ Use Fully Qualified Domain Name in SIP Requests	
☐ Allow Presentation Sharing using BFCP	

Parameters used in Phone	
Timer Invite Expires (seconds)*	180
Timer Register Delta (seconds)*	5
Timer Register Expires (seconds)*	3600
Timer T1 (msec)*	500
Timer T2 (msec)*	4000
Retry INVITE*	2
Retry Non-INVITE*	10
Start Media Port*	16384
Stop Media Port*	32766
Call Pickup URI*	x-cisco-serviceuri-pickup
Call Pickup Group Other URI*	x-cisco-serviceuri-opickup
Call Pickup Group URI*	x-cisco-serviceuri-gpickup
Meet Me Service URI*	x-cisco-serviceuri-meetme
User Info*	None
DTMF DB Level*	Nominal
Call Hold Ring Back*	Off
Anonymous Call Block*	Off
Caller ID Blocking*	Off
Do Not Disturb Control*	User
Telnet Level for 7940 and 7960*	Disabled
Timer Keep Alive Expires (seconds)*	120
Timer Subscribe Expires (seconds)*	120
Timer Subscribe Delta (seconds)*	5
Maximum Redirections*	70
Off Hook To First Digit Timer (milliseconds)*	15000
Call Forward URI*	x-cisco-serviceuri-cfwdall
Speed Dial (Abbreviated Dial) URI*	x-cisco-serviceuri-abbrdial
☒ Conference Join Enabled	
☐ RFC 2543 Hold	
☒ Semi Attended Transfer	
☐ Enable VAD	
☐ Stutter Message Waiting	

Note: Testing was conducted at CenturyLink VoIP CPE Littleton lab.



Trunk Specific Configuration

Reroute Incoming Request to new Trunk based on*

RSVP Over SIP*

☒ Fall back to local RSVP

SIP Rel1XX Options* Required for far end ringback

☐ Deliver Conference Bridge Identifier

☒ Early Offer support for voice and video calls (insert MTP if needed) Send codec's in initial INVITE, Cisco UBE set to pass through to CenturyLink

☐ Send send-receive SDP in mid-call INVITE

SIP OPTIONS Ping

☐ Enable OPTIONS Ping to monitor destination status for Trunks with Service Type "None (Default)"

Ping Interval for In-service and Partially In-service Trunks (seconds)*

Ping Interval for Out-of-service Trunks (seconds)*

Ping Retry Timer (milliseconds)*

Ping Retry Count*



Acronyms

Acronym	Definitions
SIP	Session Initiation Protocol
MGCP	Media Gateway Control Protocol
SCCP	Skinny Client Control Protocol
Cisco UCM	Cisco Unified Communications Manager
Cisco UBE	Cisco Unified Border Element



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