



The bridge to possible

Troubleshooting Webex Calling Premises-based PSTN

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Agenda

- Webex Calling PSTN Architecture
- CUBE SIP Registration
 - REGISTER-based Trunks
 - Certificate-based Trunks
- Call Routing
- SIP Troubleshooting
- Case Studies

Cisco Webex App

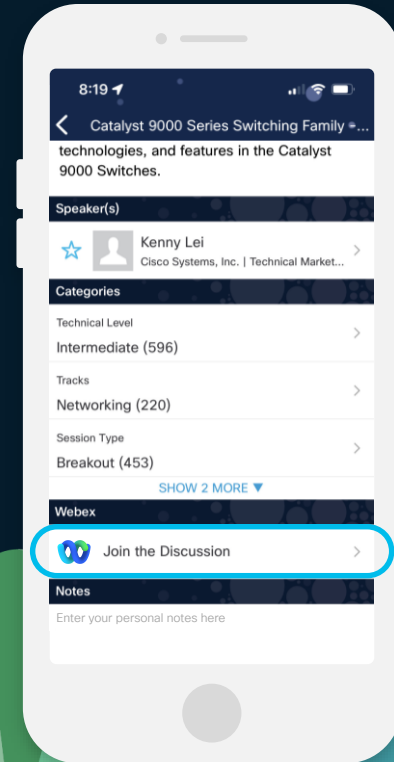
Questions?

Use Cisco Webex App to chat with the speaker after the session

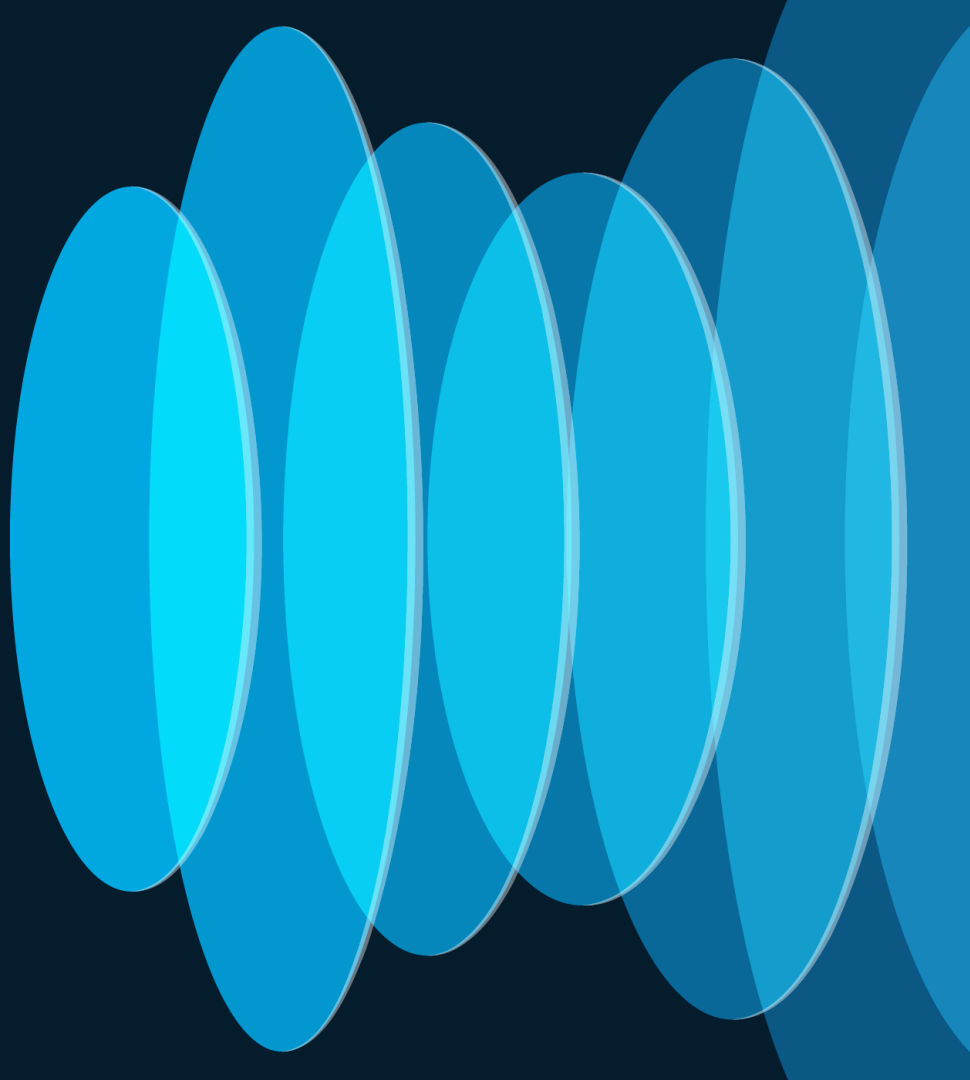
How

- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until June 7, 2024.



Webex Calling PSTN Architecture



Webex Calling PSTN Options

Connection Type

Choose the connection type for all phone numbers associated with Cisco Live Test.

Cisco PSTN

Cisco-provided PSTN provides a bundled Cisco solution that simplifies your cloud calling experience with easy PSTN ordering and full support from Cisco and our Partners.

Cloud Connected PSTN

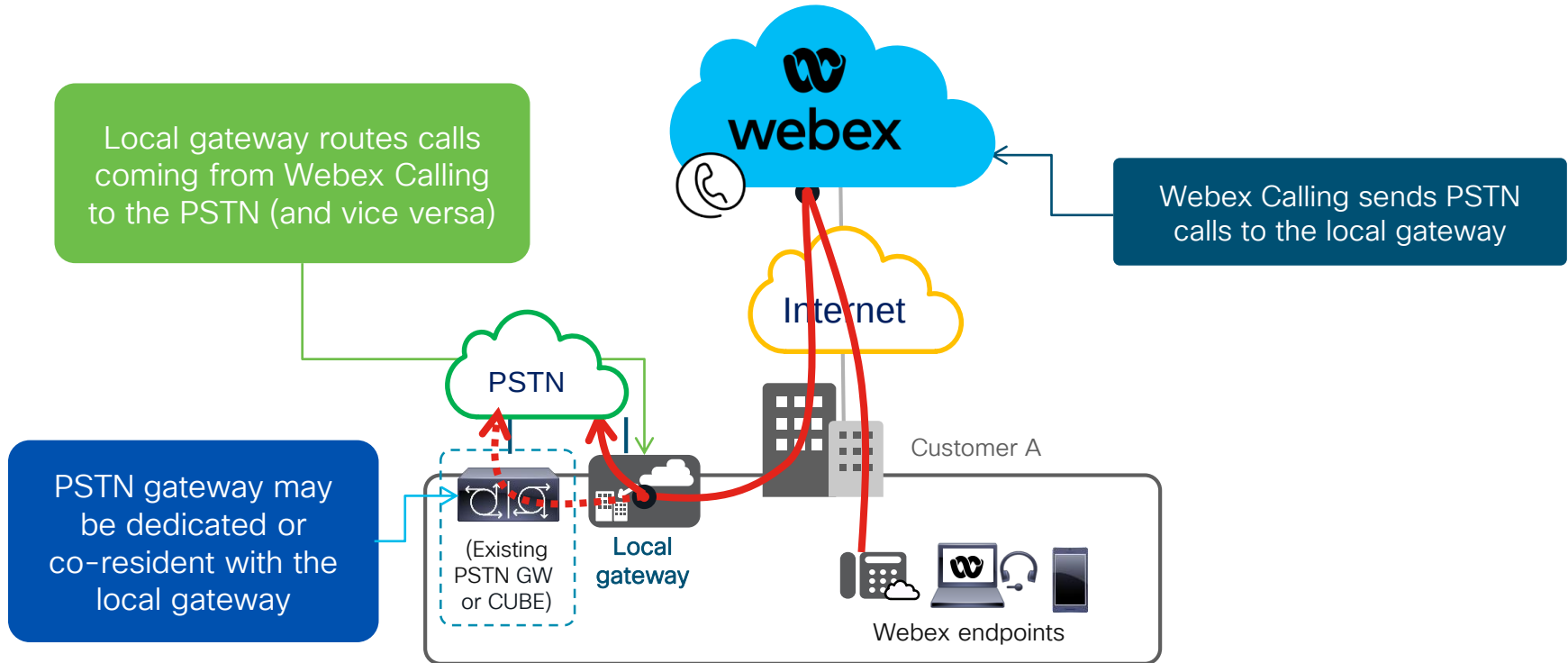
Select Cisco Cloud Connected PSTN partners that provide flexible global PSTN solutions fully integrated with Cisco's Webex Calling cloud.

Premises-based PSTN (formerly local gateway)

Bring Your Own Carrier by interconnecting any Service Provider's PSTN with a premises-based local gateway that tightly integrates to Cisco's Webex Calling cloud.

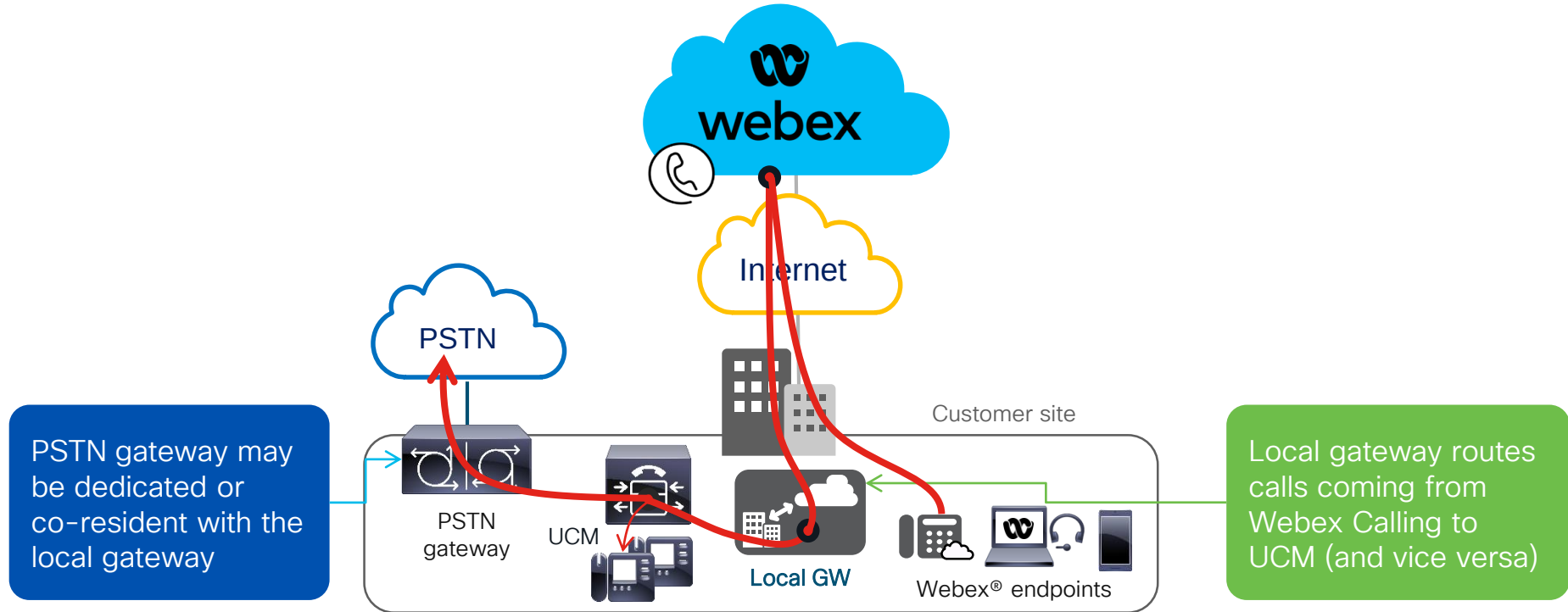
Premises-based PSTN Deployment Models

Single Site with and without separate PSTN gateway



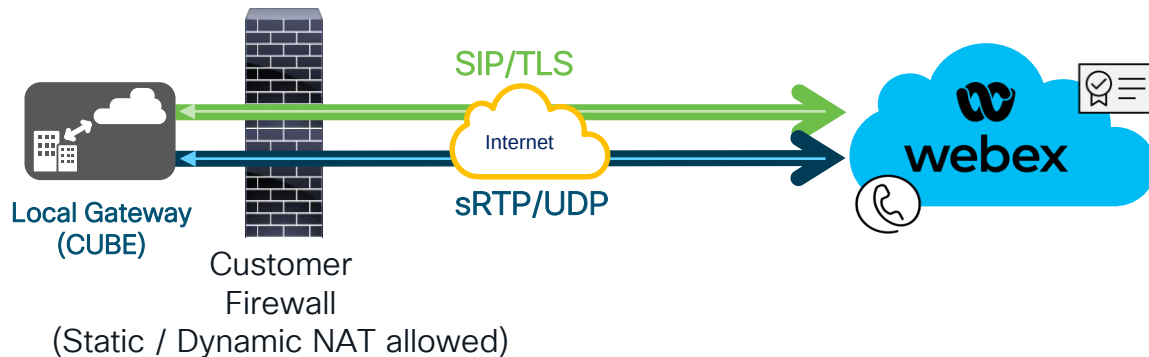
Premises-based PSTN Deployment Models

Single Site with UCM Integration

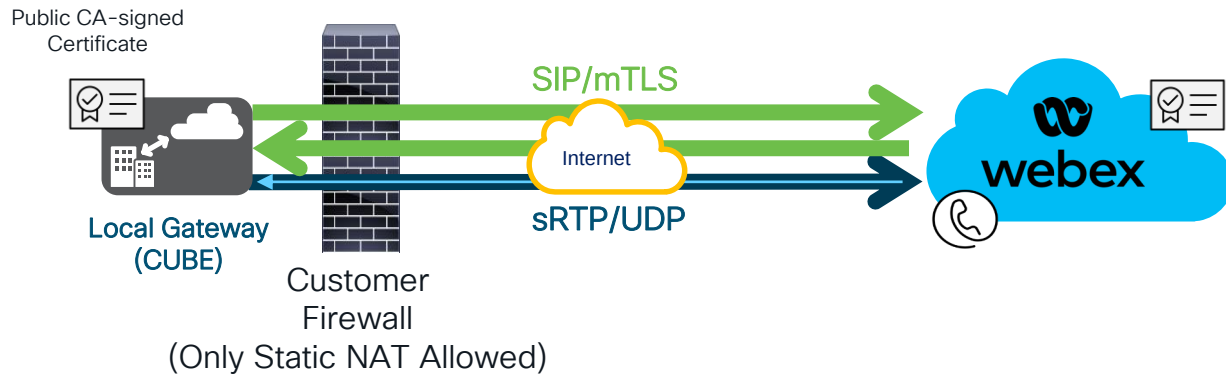


Local Gateway Connection Options

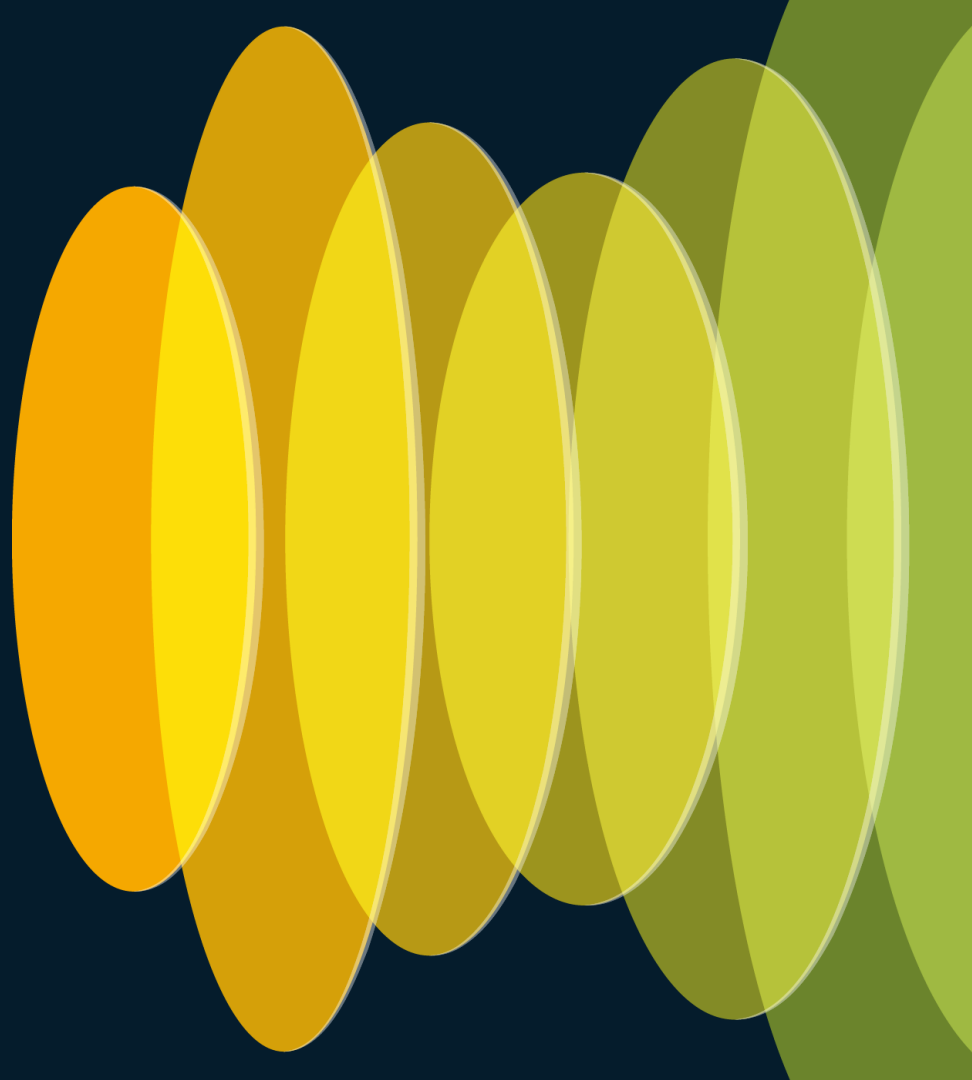
Registration-Based



Certificate-Based

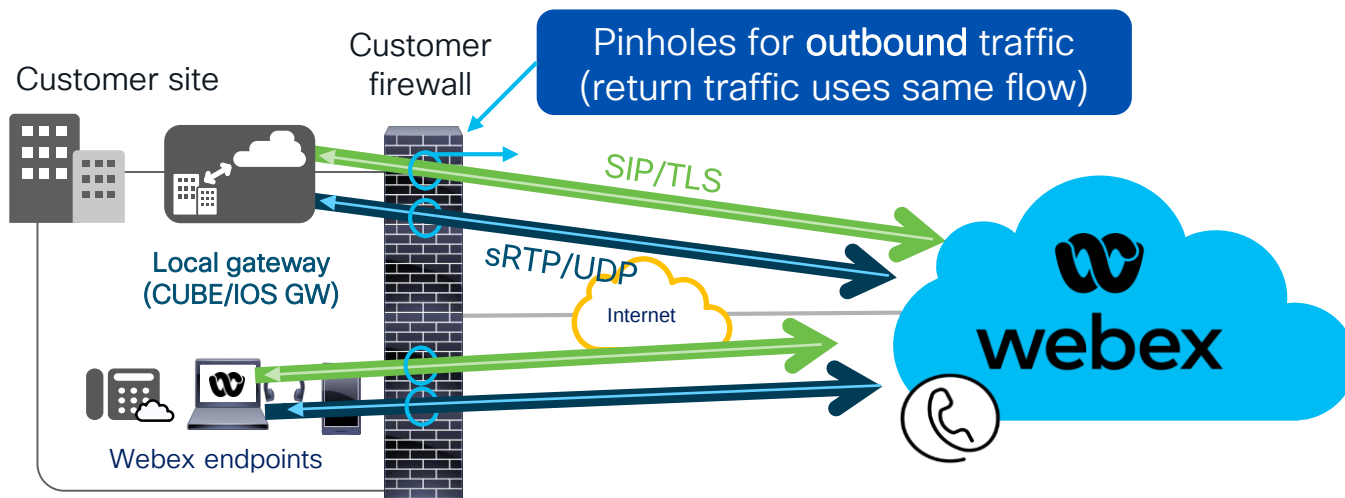


Registration-Based Local Gateway: CUBE SIP Registration



CUBE as a REGISTER-based Local Gateway

Firewall and NAT traversal



- In most cases, the local gateway and endpoints can sit on the **internal** customer network using private IP addresses (with NAT and PAT)
- Firewall needs to allow **outbound** traffic (SIP, RTP/UDP, HTTP) to specific IP addresses/ports (see updated Webex Calling port reference guide)

Firewall and NAT traversal

<https://help.webex.com/en-us/article/b2exve/Port-Reference-Information-for-Cisco-Webex-Calling>



CUBE Firewall / Port Number Reference

Firewall and NAT traversal

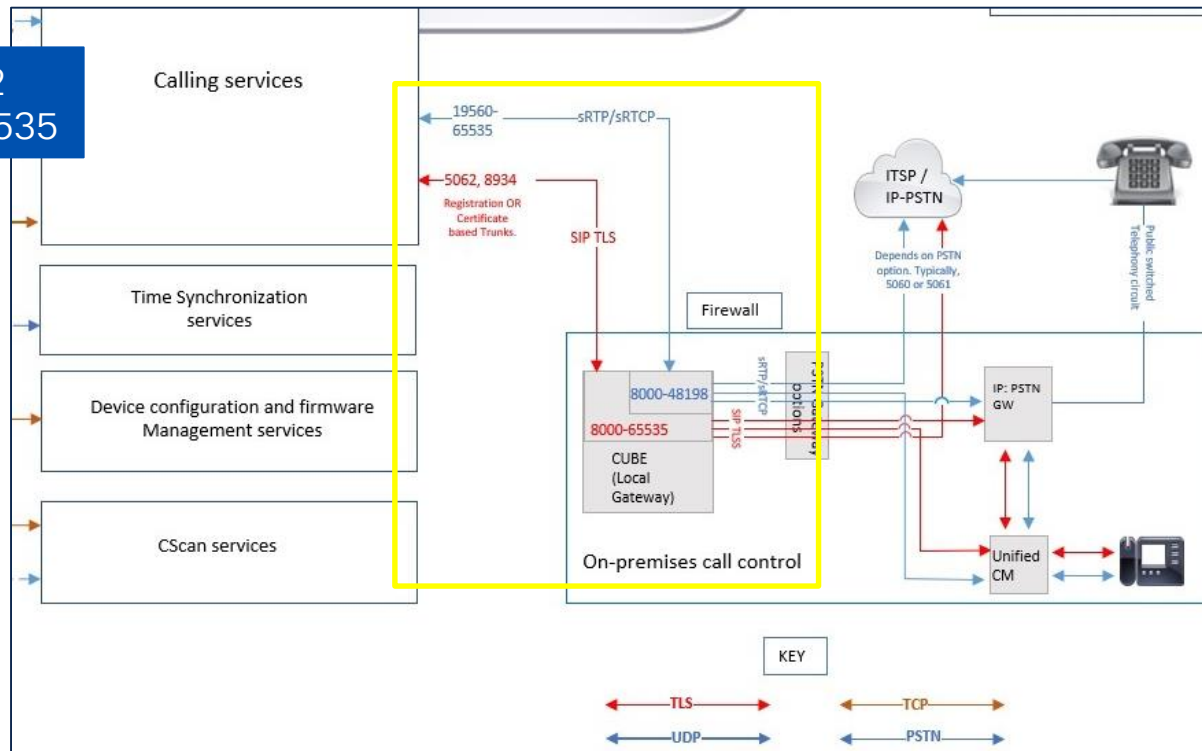
<https://help.webex.com/en-us/article/b2exve/Port-Reference-Information-for-Cisco-Webex-Calling>



- Permit TCP port 8934 or 5062
- Permit UDP ports 19560 - 65535

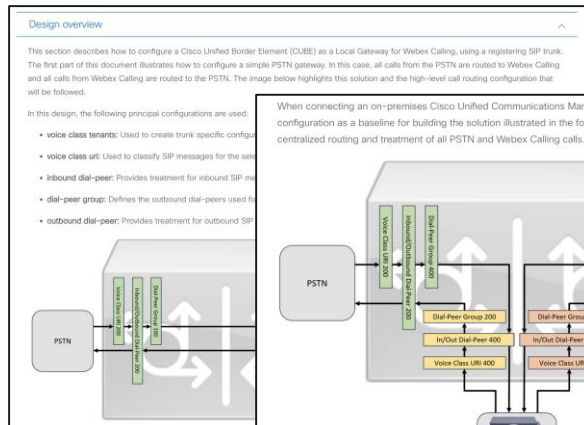
- Access to DNS

- Access to NTP

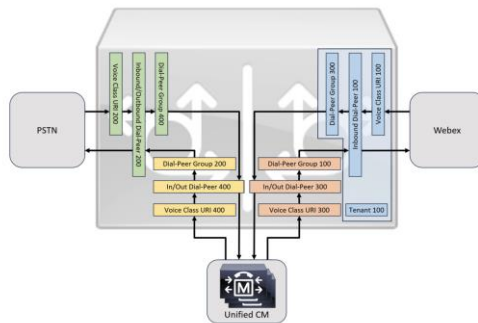


CUBE Configuration Guide

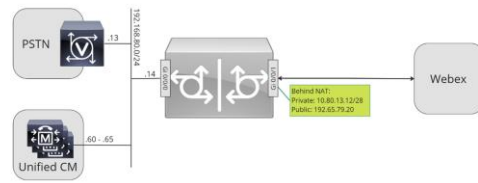
<https://help.webex.com/en-us/article/jr1i3r/Configure-Local-Gateway-on-IOS-XE-for-Webex-Calling>



When connecting an on-premises Cisco Unified Communications Manager solution with Webex Calling, you can configure CUBE as a baseline for building the solution illustrated in the following diagram. In this case, Unified Communications Manager provides centralized routing and treatment of all PSTN and Webex Calling calls.



Throughout this document, the host names, IP addresses, and interfaces illustrated in the following image are used.



Configure Webex Calling registration-based trunk

- Create a registration based PSTN trunk for an existing location in Control Hub. Make a note of the trunk information that is provided once the trunk has been created. These details, as highlighted in the following illustration, will be used in the configuration steps in this guide. For more information, see [Configure trunks, route groups, and dial plans for Webex Calling](#).

Add Trunk

Dallas Successfully created.

Visit the Route group page to add trunk(s) to a route group. Visit the Locations page to configure PSTN connections to individual locations. Visit the Dial Plans page to use this trunk as the routing choice for a dial plan.

Trunk Info

Setting	Value
Status	ONLINE
Trunk Group	OTIS0103
Outbound Proxy Address	dfw04.sipconnect-us.bld.webex.com
Registrar Domain	98027369.us10.bld.webex.com

Authentication Information

Record the username and password below. If you lose this information, you need to retrieve the username and reset the password.

Username	Password
Dallas1463285401_LGU	9WqM6iFy+

- Enter the following commands to configure CUBE as a Webex Calling Local Gateway.

```
voice service voip
ip address trusted list
ipv4 x.x.x.x y.y.y.y
mode border-element
media statistics
media bulk-stats
allow-connections sip to sip
no supplementary-service sip refer
stun
stun flowdata agent-id 1 boot-count 4
stun flowdata shared-secret 0 Password1235
sip
```

- Configure Webex Calling trunk:

- Create **voice class tenant 100** to define and group configurations required specifically for the Webex Calling trunk. In particular, the trunk registration details provided in Control Hub earlier will be used in this step as detailed below. Dial-peers associated with this tenant later will inherit these configurations.

The following example uses the values illustrated in Step 1 for the purpose of this guide (shown in bold). Replace these with values for your trunk in your configuration.

```
voice class tenant 100
  registrar dns:98027369.us10.bld.webex.com scheme sips expires 240 refresh-ratio 50 tcp tls
  credentials number Dallas1463285401_LGU username Dallas1463285401_LGU password 0 9WqM6iFy+ realm BroadWorks
  authentication username Dallas1463285401_LGU password 0 9WqM6iFy+ realm BroadWorks
  authentication username Dallas1463285401_LGU password 0 9WqM6iFy+ realm 98027369.us10.bld.webex.com
  no remote-party-id
  sip-server dns:98027369.us10.bld.webex.com
  connection-reuse
  srtp-crypto 100
  session transport tcp tls
  url sips
  error-passthru
  asserted-id pal
  bind control source-interface GigabitEthernet0/0/1
  bind media source-interface GigabitEthernet0/0/1
  no pass-thru content custom-sdp
  sip-profiles 100
  outbound-proxy dns:dfw04.sipconnect-us.bld.webex.com
  privacy-policy passthru
```

Here's an explanation of the fields for the configuration:

voice class tenant 100

Defines a set of configuration parameters that will be used only for the Webex Calling trunk. For more information, see [voice class tenant](#).

CUBE Configuration

```
voice class tenant 200
  registrar dns:12013670.us10.bcl.d.webex.com scheme sips expires 240
  refresh-ratio 50 tcp tls
  credentials number svb-rtp-dmz-cube8a5913_LGU username
    svb-rtp-dmz-cube8a2637_LGU password 0 Password123 realm BroadWorks
  authentication username svb-rtp-dmz-cube8a2637_LGU password 0
    Password123 realm BroadWorks
  authentication username svb-rtp-dmz-cube8a2637_LGU password 0
    Password123 realm 12013670.us10.bcl.d.webex.com
  no remote-party-id
  sip-server dns:12013670.us10.bcl.d.webex.com
  connection-reuse
  srtp-crypto 200
  session transport tcp tls
  url sips
  error-passthru
  asserted-id pai
  bind control source-interface GigabitEthernet1
  bind media source-interface GigabitEthernet1
  no pass-thru content custom-sdp
  sip-profiles 200
  outbound-proxy dns:ch05.sipconnect-us.bcl.d.webex.com
  privacy-policy passthru
```

svs-rtp-dmz-cube8a ✕

Trunk > Details

Status

● Online

Registrar Domain

12013670.us10.bcl.d.webex.com

Trunk Group OTG/DTG

svs-rtp-dmz-cube8a2637_lgu

Line/Port

svs-rtp-dmz-cube8a5913_LGU@120136

Outbound Proxy Address

ch05.sipconnect-us.bcl.d.webex.com

Authentication Information

Retrieve the username and password for
retrieved, a new password is generated.
password is saved.

Retrieve Username and Reset Password

Authentication Information

Record the username and password below. If you lose this
information, you need to reset the password again.

Username

svs-rtp-dmz-cube8a2637_LGU

Password

Password123

Done

Dual Identity Support

The Dual Identity Support setting impacts the handling of the From header and P-Asserted-Identity (PAI)
header when sending an initial SIP INVITE to the trunk for an outbound call. When enabled, the From and
PAI headers are treated independently and may differ. When disabled, the PAI header is set to the same
value as the From header. Please refer to the documentation for more details.

☒

Managed Gateway – Config Validation

Calling > Managed Gateways

Calling

NumbersVirtual LinesCall RoutingManaged GatewaysFeaturesPSTNService Settings>>

Qsvs×

All Gateways

2 Gateway(s)

Events History

Add Gateway

Gateway Name	Version	Connector Status	Service	Assigned to	Actions
svs-rtp-dmz-cube8a	17.12.2	● Online	Local Gateway	Trunk: svs-rtp-dmz-cube8a	...

Local Gateway Service

Trunk [svs-rtp-dmz-cube8a](#)

Config
Validation

Validation completed on May 31,
2024, 5:31:01 PM

Validate

View results

Managed Gateway

- Requires Gateway Connector be installed on Local Gateway
- Performs basic configuration validation
- Not all configuration is checked today
- Can miss some misconfiguration such as invalid password (it cannot see what your password is)

```
svs-rtp-dmz-cube8a#sh run | beg codec  
voice class codec 99  
  codec preference 1 g711ulaw  
  codec preference 2 g711alaw
```

Validated Configuration

Report Date : June 5, 2023 7:16 AM
6 sections validated, 1 section(s) have issues.

✓

sip-ua

No issues found

▼

✓

voice service voip

No issues found

▼

✗

dial-peer voice 200201 voip (Webex Calling dial-peer found, validated for inbound and outbound calling)

1 misconfigured

▲

Misconfigured: 'voice-class codec <tag>' found but required class commands are missing/misconfigured.

Reference configuration

dial-peer voice 200201 voip
description Inbound/Outbound Webex Calling
max-conn 250
destination-pattern BAD.BAD
session protocol sipv2
session target sip-server
destination dpq 100
incoming uri request 200
voice-class codec 99
voice-class stun-usage 200

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Managed Gateway

- Requires Gateway Connector be installed on Local Gateway
- Performs basic configuration validation
- Not all configuration is checked today
- Can miss some misconfiguration such as invalid password (it cannot see what your password is)

```
svs-rtp-dmz-cube8a#sh run | beg codec
voice class codec 99
  codec preference 1 opus
  codec preference 2 g711ulaw
  codec preference 3 g711alaw
```

Validated Configuration

Report Date : June 5, 2023 7:24 AM
6 sections validated, 0 section(s) have issues.

sip-ua
No issues found

voice service voip
No issues found

dial-peer voice 200201 voip (Webex Calling dial-peer found, validated for inbound and outbound calling)
No issues found

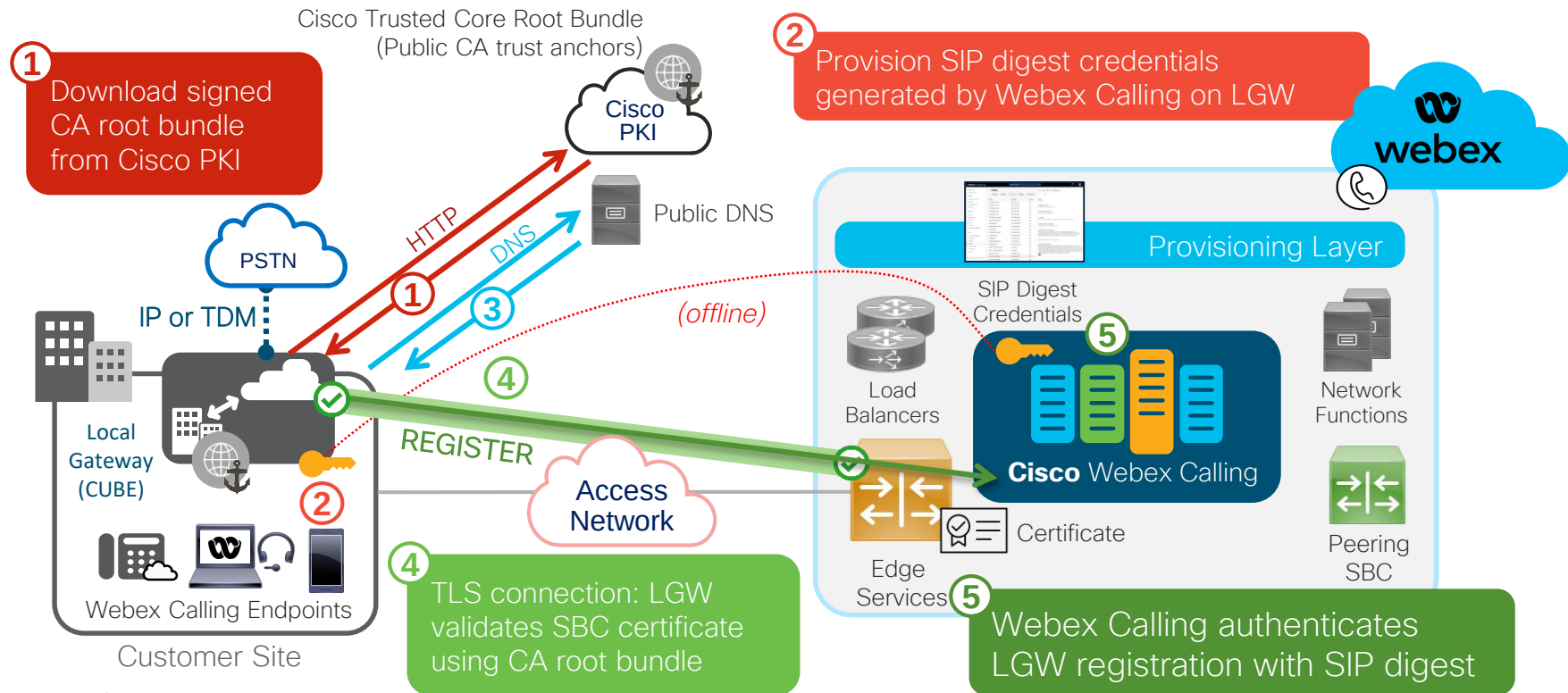
global
No issues found

voice class sip-profiles 200
No issues found

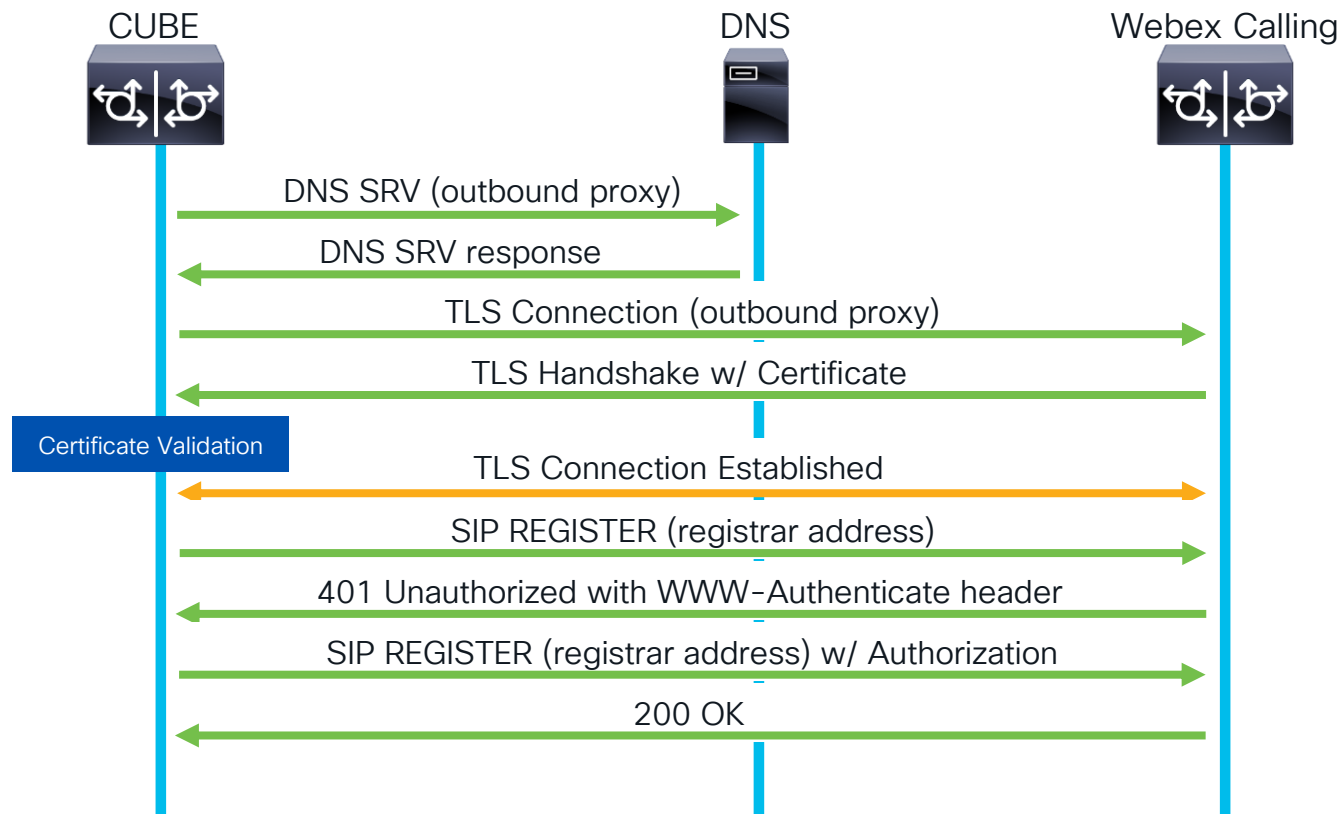
voice class tenant 200
No issues found

CUBE Onboarding and Registration

Registration-based Trunks



CUBE Registration Process



Troubleshooting DNS Issues

```
> dig SRV _sips._tcp ch05.sipconnect-us.bclld.webex.com
```



Outbound proxy address

```
;; ANSWER SECTION:
```

```
_sips._tcp.ch05.sipconnect-us.bclld.webex.com. 300 IN SRV 10 50 8934 sipconnect01ac-us.bclld.webex.com.  
_sips._tcp.ch05.sipconnect-us.bclld.webex.com. 300 IN SRV 5 50 8934 sipconnect02ac-us.bclld.webex.com.
```

```
> dig A sipconnect02ac-us.bclld.webex.com
```

```
;; ANSWER SECTION:
```

```
sipconnect02ac-us.bclld.webex.com. 5 IN A 139.177.65.12
```

```
> dig A sipconnect01ac-us.bclld.webex.com
```

```
;; ANSWER SECTION:
```

```
sipconnect01ac-us.bclld.webex.com. 5 IN A 139.177.64.12
```

Troubleshooting DNS Issues

CUBE#**show sip-ua statistics | beg SIP Global**

SIP Global Counters:

<File Id,	Line:	Count	First Occurence	Most Recent Occurence
Message>				
0x12	, 1155	: 5	May 27 2024 09:38:00	Jun 02 2024 20:53:59
DNS Query failed for query_type:%d				

Troubleshooting DNS Issues

CUBE#**debug ip domain**

```
*May 31 17:29:22.434: DNS: detail: cdns_get_first_hop: dst 64.102.6.247, intf NULL
*May 31 17:29:23.435: DNS: detail: iter_operate: iterator[module 1] operate: extstate:module_wait_reply event:module_event_noreply
*May 31 17:29:23.435: DNS: info: log_name_typeclass: iterator operate: query _sips._tcp.12013670.us10.bcld.webex.com. SRV IN
*May 31 17:29:23.435: DNS: info: log_name_typeclass: processQueryTargets: _sips._tcp.12013670.us10.bcld.webex.com. SRV IN
*May 31 17:29:23.435: DNS: info: log_name_typeclass: sending query: _sips._tcp.12013670.us10.bcld.webex.com. SRV IN
*May 31 17:29:23.435: DNS: detail: log_name_addr: sending to target: <.> 64.102.6.247#53
*May 31 17:29:23.435: DNS: detail: cdns_get_first_hop: dst 64.102.6.247, intf NULL
*May 31 17:29:25.435: DNS: detail: cdns_get_first_hop: dst 64.102.6.247, intf NULL
*May 31 17:29:27.436: DNS: detail: iter_operate: iterator[module 1] operate: extstate:module_wait_reply event:module_event_noreply
*May 31 17:29:27.436: DNS: info: log_name_typeclass: iterator operate: query _sips._tcp.12013670.us10.bcld.webex.com. SRV IN
*May 31 17:29:27.436: DNS: info: log_name_typeclass: processQueryTargets: _sips._tcp.12013670.us10.bcld.webex.com. SRV IN
*May 31 17:29:27.436: DNS: detail: can_have_last_resort: configured forward servers failed -- returning SERVFAIL
*May 31 17:29:27.436: DNS: detail: error_response: return error response SERVFAIL
```

Registrar Domain

12013670.us10.bcld.webex.com

Trunk Group OTG/DTG

svs-rtp-dmz-cube8a2637_lgu

Line/Port

svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com

Outbound Proxy Address

ch05.sipconnect-us.bcld.webex.com

Troubleshooting DNS Issues

After fixing outbound proxy

CUBE#**debug ip domain**

```
*May 31 17:27:04.713: DNS: detail: cdns_get_rr_type: converting name kind 20000 to type 33
*May 31 17:27:04.713: DNS: detail: read_forwards: Forward zone server list:
*May 31 17:27:04.713: DNS: info: delegpt_log: DelegationPoint<.>: 0 names (0 missing), 1 addrs (0 result, 1 avail) parentNS
*May 31 17:27:04.713: DNS: detail: val_operate: validator[module 0] operate: extstate:module_state_initial event:module_event_new
*May 31 17:27:04.713: DNS: info: log_nametypeclass: validator operate: query _sips._tcp.ch05.sipconnect-us.bcld.webex.com. SRV IN
*May 31 17:27:04.713: DNS: detail: iter_operate: iterator[module 1] operate: extstate:module_state_initial event:module_event_pass
*May 31 17:27:04.714: DNS: info: log_nametypeclass: resolving _sips._tcp.ch05.sipconnect-us.bcld.webex.com. SRV IN
*May 31 17:27:04.714: DNS: info: log_nametypeclass: finishing processing for _sips._tcp.ch05.sipconnect-us.bcld.webex.com. SRV IN
*May 31 17:27:04.714: DNS: detail: val_operate: validator[module 0] operate: extstate:module_wait_module event:module_event_moddone
*May 31 17:27:04.714: DNS: info: log_nametypeclass: validator operate: query _sips._tcp.ch05.sipconnect-us.bcld.webex.com. SRV IN
*May 31 17:27:04.714: DNS: detail: cdns_new_nametype: new nametype 0x80007F39A6FE2CE0
*May 31 17:27:04.714: DNS: detail: cdns_get_rr_type: converting name kind 4 to type 1
*May 31 17:27:04.714: DNS: detail: read_forwards: Forward zone server list:
*May 31 17:27:04.714: DNS: info: delegpt_log: DelegationPoint<.>: 0 names (0 missing), 1 addrs (0 result, 1 avail) parentNS
*May 31 17:27:04.715: DNS: detail: val_operate: validator[module 0] operate: extstate:module_state_initial event:module_event_new
*May 31 17:27:04.715: DNS: info: log_nametypeclass: validator operate: query sipconnect02ac-us.bcld.webex.com. A IN
*May 31 17:27:04.715: DNS: detail: iter_operate: iterator[module 1] operate: extstate:module_state_initial event:module_event_pass
*May 31 17:27:04.715: DNS: info: log_nametypeclass: resolving sipconnect02ac-us.bcld.webex.com. A IN
*May 31 17:27:04.715: DNS: info: log_nametypeclass: finishing processing for sipconnect02ac-us.bcld.webex.com. A IN
*May 31 17:27:04.715: DNS: detail: val_operate: validator[module 0] operate: extstate:module_wait_module event:module_event_moddone
*May 31 17:27:04.715: DNS: info: log_nametypeclass: validator operate: query sipconnect02ac-us.bcld.webex.com. A IN
*May 31 17:27:04.715: DNS: detail: cdns_new_nametype: new nametype 0x80007F39AF441638
*May 31 17:27:04.715: DNS: detail: cdns_nametype_free: deleting nametype 0x80007F39AF441638
*May 31 17:27:04.715: DNS: detail: cdns_nametype_free: deleting nametype 0x80007F39A6FE2CE0
```

Check TCP Session Establishment

```
svs-rtp-dmz-cube8a#show tcp brief numeric
```

TCB	Local Address	Foreign Address	(state)
7F39A6F861A8	64.102.250.135.50993	139.177.65.12.8934	ESTAB

Check TCP Session Establishment – Failure

```
svs-rtp-dmz-cube8a#debug ip tcp transactions address 139.177.65.12
May 26 13:41:30.135: TCP: Setting Keepalive interval and retries to 60 and 4
May 26 13:41:30.135: tcp_uniqueport: using ephemeral max 55000
May 26 13:41:30.139: TCP: Setting Keepalive interval and retries to 60 and 4
May 26 13:41:30.139: tcp_uniqueport: using ephemeral max 55000
May 26 13:41:30.139: Reserved port 20588 in Transport Port Agent for TCP IP type 1
May 26 13:41:30.140: TCP0: Connection to 139.177.65.12:8934, advertising MSS 536
May 26 13:41:30.140: TCP0: state was CLOSED -> SYNSENT [20588 -> 139.177.65.12 (8934)]
May 26 13:41:30.140: Released port 20588 in Transport Port Agent for TCP IP type 1 delay 240000
May 26 13:41:30.141: TCP0: state was SYNSENT -> CLOSED [20588 -> 139.177.65.12 (8934)]
May 26 13:41:30.141: TCP0: bad seg from 139.177.65.12 -- closing connection: port 20588 seq 0 ack
19785811 rcvnxt 0 rcvwnd 0 len 0
May 26 13:41:30.141: TCP0: connection closed - remote sent RST
May 26 13:41:30.141: TCB7F5EFFA41B78 getting property TCP_VRFTABLEID (20)
May 26 13:41:30.141: TCB 0x7F5EFFA41B78 destroyed
```

TLS Handshake Failure

- TLS Handshake failure will display a Syslog message:

```
Jan 24 08:11:50.364: %SIP-2-TLS_HANDSHAKE_FAILED: TLS handshake failure - remote_addr= 139.177.65.12, remote_port=8934
```

Verify TLS Connection

```
CUBE#show sip-ua connections tcp tls detail
```

```
Total active connections      : 1
No. of send failures          : 1
No. of remote closures        : 0
No. of conn. failures         : 0
No. of inactive conn. ageouts : 0
Max. tls send msg queue size of 1, recorded for 139.177.65.12:8934
TLS client handshake failures : 0
TLS server handshake failures : 0
```

```
-----Printing Detailed Connection Report-----
```

Note:

- ** Tuples with no matching socket entry
 - Do 'clear sip <tcp[tls]/udp> conn t ipv4:<addr>:<port>' to overcome this error condition
- ++ Tuples with mismatched address/port entry
 - Do 'clear sip <tcp[tls]/udp> conn t ipv4:<addr>:<port> id <connid>' to overcome this error condition
- * Connections with SIP OAuth ports

```
Remote-Agent:139.177.65.12, Connections-Count:1
```

Remote-Port	Conn-Id	Conn-State	WriteQ-Size	Local-Address	TLS-Version	Cipher	Curve	Tenant
8934	7	Established	0	64.102.250.135:50993	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-521	0

```
----- SIP Transport Layer Listen Sockets -----
```

Conn-Id	Local-Address	Tenant
0	[0.0.0.0]:5061:	0
6	[64.102.250.135]:5061:Internet	0

Local Gateway Trustpool Update

- The default trustpool bundle does not include the “DigiCert Root CA” certificate needed for validating the server-side certificate during TLS connection establishment to BroadCloud
- Download the latest “Cisco Trusted Core Root Bundle” from <http://www.cisco.com/security/pki/>

Check

```
CUBE#show crypto pki trustpool | include DigiCert
```

Update

```
CUBE #configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
LocalGateway(config)#crypto pki trustpool import clean url
http://www.cisco.com/security/pki/trs/ios_core.p7b
Reading file from http://www.cisco.com/security/pki/trs/ios_core.p7b
Loading http://www.cisco.com/security/pki/trs/ios_core.p7b
% PEM files import succeeded.
LocalGateway(config)#end
```

Verify

```
CUBE #show crypto pki trustpool | include DigiCert
cn=DigiCert Global Root CA
o=DigiCert Inc
cn=DigiCert Global Root CA
o=DigiCert Inc
```

TLS Connection Setup

voice class tenant 200

```
registrar dns:12013670.us10.bcld.webex.com scheme sips expires 240 refresh-ratio 50 tcp tls
credentials number svr-rtp-dmz-cube8a5913_LGU username svr-rtp-dmz-cube8a2637_LGU password 6 <removed> ...
authentication username svr-rtp-dmz-cube8a2637_LGU password 6 <removed> realm BroadWorks
authentication username svr-rtp-dmz-cube8a2637_LGU password 6 <removed> realm 12013670.us10.bcld.webex.com
no remote-party-id
sip-server dns:12013670.us10.bcld.webex.com
connection-reuse
srtp-crypto 200
session transport tcp tls
url sips
error-passthru
asserted-id pai
bind control source-interface GigabitEthernet1
bind media source-interface GigabitEthernet1
no pass-thru content custom-sdp
sip-profiles 200
outbound-proxy dns:ch05.sipconnect-us.bcld.webex.com
privacy-policy passthru
```

sip-ua

transport tcp tls v1.2

crypto signaling default trustpoint dummyTp cn-san-validate server

- Source IP is based on the **bind control** configuration. Source port is ephemeral
 - **TLS version** and **crypto trustpoint** and **CN/SAN validation** is configured under sip-ua
- Note:** The crypto trustpoint is needed for TLS to work even though a local client certificate (i.e. mTLS) is not required for the connection to be setup

Showing SIP registration status

```
CUBE#show sip-ua register status
```

```
Tenant: 200
```

```
----- Registrar-Index 1 -----  
Line                               peer      expires(sec)  reg survival  P-Associ-URI  
=====
```

svs-rtp-dmz-cube8a5913_LGU	-1	56	no	normal	
----------------------------	----	----	----	--------	--

```
=====
```

Troubleshooting Registration Issues

CUBE#**debug ccsip message**

CUBE#**debug ccsip non-call**

*Jun 2 20:00:55.047: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:

Sent:

REGISTER sip:12013670.us10.bcld.webex.com:5061 SIP/2.0

Via: SIP/2.0/TLS 64.102.250.135:5061;branch=z9hG4bK37F2657

From: <sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com;otg=svs-rtp-dmz-cube8a2637_lgu>;tag=3229010F-153

To: <sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com>

Date: Thu, 02 Jun 2022 20:00:55 GMT

Call-ID: ABBD84C-E03E11EC-8005C535-8219C882

User-Agent: Cisco-SIPGateway/IOS-17.8.1a

Max-Forwards: 70

Timestamp: 1654200055

CSeq: 3028 REGISTER

Contact: <sip:svs-rtp-dmz-cube8a5913_LGU@64.102.250.135:5061;transport=tls>

Expires: 240

Supported: path

Content-Length: 0

Troubleshooting Registration Issues

```
*Jun  2 20:00:55.097: //12502/000000000000/SIP/Msg/ccsipDisplayMsg:
Received:
SIP/2.0 401 Unauthorized
Via:SIP/2.0/TLS 64.102.250.135:5061;branch=z9hG4bK37F2657
From:<sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bclld.webex.com;otg=svs-rtp-dmz-
cube8a2637_lgu>;tag=3229010F-153
To:<sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bclld.webex.com>;tag=139819501-1654200075749
Call-ID:ABBD84C-E03E11EC-8005C535-8219C882
CSeq:3028 REGISTER
Session-ID:84b3c5760080414f9684277168c26d0b;remote=13a947af00804b4dba1347ec16e6cc55
WWW-Authenticate:DIGEST realm="BroadWorks",qop="auth",nonce="BroadWorksXl3xh0jboTdvjlnkBW",
algorithm=MD5
Contact:<sip:svs-rtp-dmz-cube8a5913_LGU@64.102.250.135:5061;transport=tls>;expires=120
Content-Length:0
```

Troubleshooting Registration Issues

```
*Jun  2 20:00:55.098: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:
Sent:
REGISTER sip:12013670.us10.bclld.webex.com:5061 SIP/2.0
Via: SIP/2.0/TLS 64.102.250.135:5061;branch=z9hG4bK37F32160
From: <sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bclld.webex.com;otg=svs-rtp-dmz-
cube8a2637_lgu>;tag=3229010F-153
To: <sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bclld.webex.com>
Date: Thu, 02 Jun 2022 20:00:55 GMT
Call-ID: ABBD84C-E03E11EC-8005C535-8219C882
User-Agent: Cisco-SIPGateway/IOS-17.8.1a
Max-Forwards: 70
Timestamp: 1654200055
CSeq: 3029 REGISTER
Contact: <sip:svs-rtp-dmz-cube8a5913_LGU@64.102.250.135:5061;transport=tls>
Expires: 240
Supported: path
Authorization: Digest username="svs-rtp-dmz-cube8a2637_LGU",realm="BroadWorks",
uri="sips:12013670.us10.bclld.webex.com:5061",response="3e5fb6c7664832a0de686e9fd9defcf3",
nonce="BroadWorksXl3xh0jboTdvjlnkBW",cnonce="59C09EF6",qop=auth,algorithm=MD5,nc=00000001
Content-Length: 0
```

Troubleshooting Registration Issues

*Jun 2 20:00:55.146: //12502/000000000000/SIP/Msg/ccsipDisplayMsg:

Received:

SIP/2.0 401 Unauthorized

Via:SIP/2.0/TLS 64.102.250.135:5061;branch=z9hG4bK37F32160

From:<sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bclld.webex.com;otg=svs-rtp-dmz-cube8a2637_lgu>;tag=3229010F-153

To:<sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bclld.webex.com>;tag=187893186-1654200075798

Call-ID:ABBD84C-E03E11EC-8005C535-8219C882

CSeq:3029 REGISTER

Session-ID:84b3c5760080414f9684277168c26d0b;remote=13a947af00804b4dba1347ec16e6cc55

Content-Length:0

Troubleshooting Registration Issues

Control Hub > Calling > Call Routing > Trunk > *select trunk*

Authentication Information

Retrieve the username and password for **CUBE LGW**. Each time authentication information is retrieved, a new password is generated. During the password generation, PSTN is disrupted until the new password is saved.

[Retrieve Username and Reset Password](#)

Authentication Information



Retrieving authentication information generates a new password and disrupts PSTN service for locations using this trunk until the password reset is completed. Do you want to continue?

No

Yes

Authentication Information

Record the username and password below. If you lose this information, you need to reset the password again.

Username

svs-rtp-dmz-cube8a2637_LGU 

Password

NewPassword 

Done

Troubleshooting Registration Issues

```
CUBE(config)#voice class tenant 200
CUBE(config-class)#$svs-rtp-dmz-cube8a5913_LGU username svs-rtp-dmz-cube8a2637_LGU password 0
NewPassword realm BroadWorks
```

Updating password

```
CUBE(config-class)#authentication username svs-rtp-dmz-cube8a2637_LGU password 0 NewPassword realm
BroadWorks
```

Updating username/password for realm BroadWorks

```
CUBE(config-class)#authentication username svs-rtp-dmz-cube8a2637_LGU password 0 NewPassword realm
12013670.us10.bcld.webex.com
```

Updating username/password for realm 12013670.us10.bcld.webex.com

```
svs-rtp-dmz-cube8a(config-class)#end
```

Troubleshooting Registration Issues

```
*Jun  2 20:10:55.744: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:
Sent:
REGISTER sip:12013670.us10.bcld.webex.com:5061 SIP/2.0
Via: SIP/2.0/TLS 64.102.250.135:5061;branch=z9hG4bK37FC26BD
From: <sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com;otg=svs-rtp-dmz-
cube8a2637_lgu>;tag=32322B88-25CD
To: <sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com>
Date: Thu, 02 Jun 2022 20:10:55 GMT
Call-ID: ABBD84C-E03E11EC-8005C535-8219C882
User-Agent: Cisco-SIPGateway/IOS-17.8.1a
Max-Forwards: 70
Timestamp: 1654200655
CSeq: 3038 REGISTER
Contact: <sip:svs-rtp-dmz-cube8a5913_LGU@64.102.250.135:5061;transport=tls>
Expires: 240
Supported: path
Content-Length: 0
```

Troubleshooting Registration Issues

```
*Jun  2 20:10:55.793: //12507/000000000000/SIP/Msg/ccsipDisplayMsg:
Received:
SIP/2.0 401 Unauthorized
Via:SIP/2.0/TLS 64.102.250.135:5061;branch=z9hG4bK37FC26BD
From:<sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com;otg=svs-rtp-dmz-
cube8a2637_lgu>;tag=32322B88-25CD
To:<sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com>;tag=45425073-1654200676460
Call-ID:ABBD84C-E03E11EC-8005C535-8219C882
CSeq:3038 REGISTER
Session-ID:7a89fbce008049b78a69e029c3dcf14d;remote=982680ab00804b63afafa55ec45f8f8b
WWW-Authenticate:DIGEST
realm="BroadWorks",qop="auth",nonce="BroadWorksXl3xgdeu4T9663sfBW",algorithm=MD5
Contact:<sip:svs-rtp-dmz-cube8a5913_LGU@64.102.250.135:5061;transport=tls>;expires=120
Content-Length:0
```

Troubleshooting Registration Issues

```
*Jun  2 20:10:55.795: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:
Sent:
REGISTER sip:12013670.us10.bcld.webex.com:5061 SIP/2.0
Via: SIP/2.0/TLS 64.102.250.135:5061;branch=z9hG4bK37FD946
From: <sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com;otg=svs-rtp-dmz-
cube8a2637_lgu>;tag=32322B88-25CD
To: <sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com>
Date: Thu, 02 Jun 2022 20:10:55 GMT
Call-ID: ABBD84C-E03E11EC-8005C535-8219C882
User-Agent: Cisco-SIPGateway/IOS-17.8.1a
Max-Forwards: 70
Timestamp: 1654200655
CSeq: 3039 REGISTER
Contact: <sip:svs-rtp-dmz-cube8a5913_LGU@64.102.250.135:5061;transport=tls>
Expires: 240
Supported: path
Authorization: Digest username="svs-rtp-dmz-
cube8a2637_LGU",realm="BroadWorks",uri="sips:12013670.us10.bcld.webex.com:5061",response="84ee9
b374977c02315e6c75579a47175",nonce="BroadWorksXl3xgdeu4T9663sfBW",cnonce="D193A761",qop=auth,al
gorithm=MD5,nc=00000001
Content-Length: 0
```

Troubleshooting Registration Issues

*Jun 2 20:10:55.843: //12507/000000000000/SIP/Msg/ccsipDisplayMsg:

Received:

SIP/2.0 200 OK

Via:SIP/2.0/TLS 64.102.250.135:5061;branch=z9hG4bK37FD946

From:<sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com;otg=svs-rtp-dmz-cube8a2637_lgu>;tag=32322B88-25CD

To:<sip:svs-rtp-dmz-cube8a5913_LGU@12013670.us10.bcld.webex.com>;tag=656451609-1654200676510

Call-ID:ABBD84C-E03E11EC-8005C535-8219C882

CSeq:3039 REGISTER

Session-ID:7a89fbce008049b78a69e029c3dcf14d;remote=982680ab00804b63afafa55ec45f8f8b

Allow-Events:call-info,line-seize,dialog,message-summary,as-feature-event,x-broadworks-hoteling,x-broadworks-call-center-status,conference

Contact:<sip:svs-rtp-dmz-cube8a5913_LGU@64.102.250.135:5061;transport=tls>;q=0.5;expires=120

Path:<sip:10.71.132.84:5060;transport=udp;lr>;x-bw-nat="64.102.250.135:50993;transport=tls"

Content-Length:0

Troubleshooting Registration Issues

```
svs-rtp-dmz-cube8a#show sip-ua register status
```

```
Tenant: 200
```

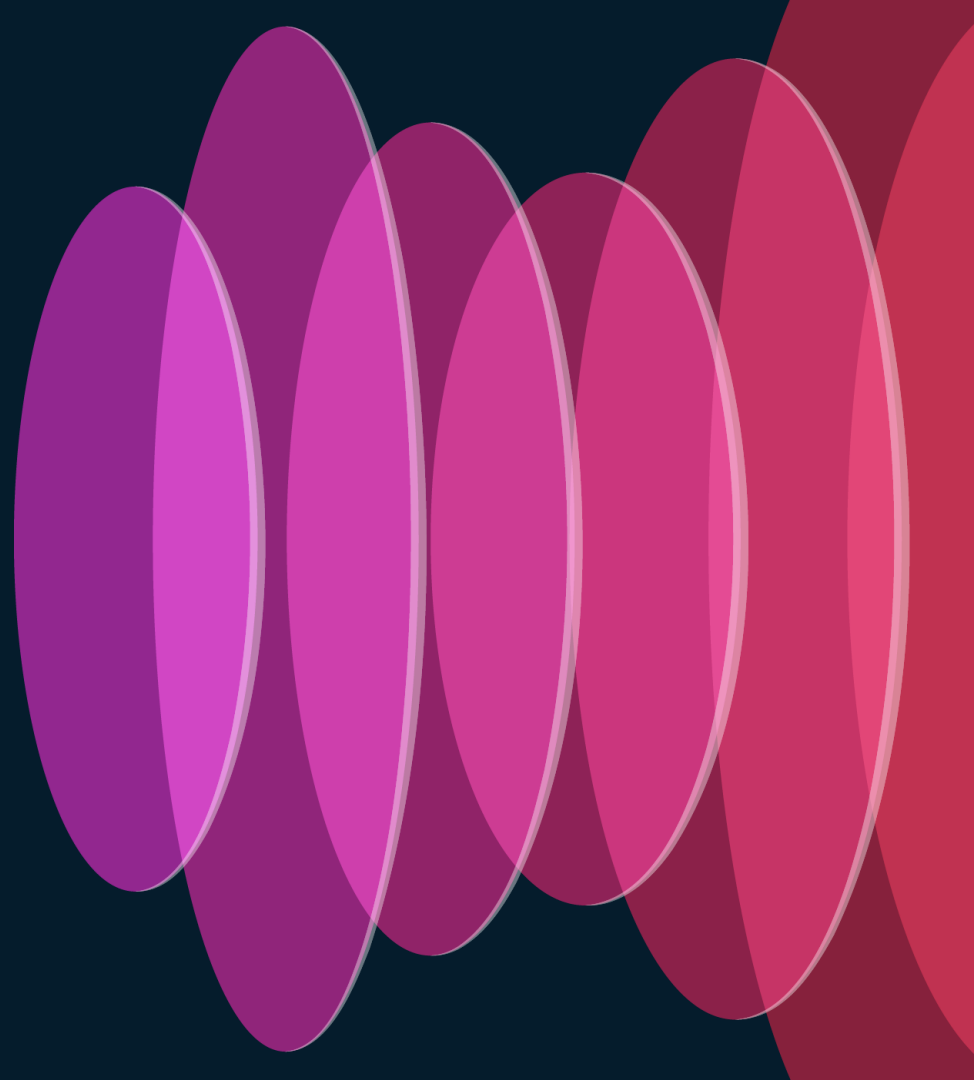
```
----- Registrar-Index 1 -----  
Line                peer      expires(sec)  reg survival  P-Associ-URI  
=====
```

Line	peer	expires(sec)	reg	survival	P-Associ-URI
svs-rtp-dmz-cube8a5913_LGU	-1	30	yes	normal	

```
=====
```

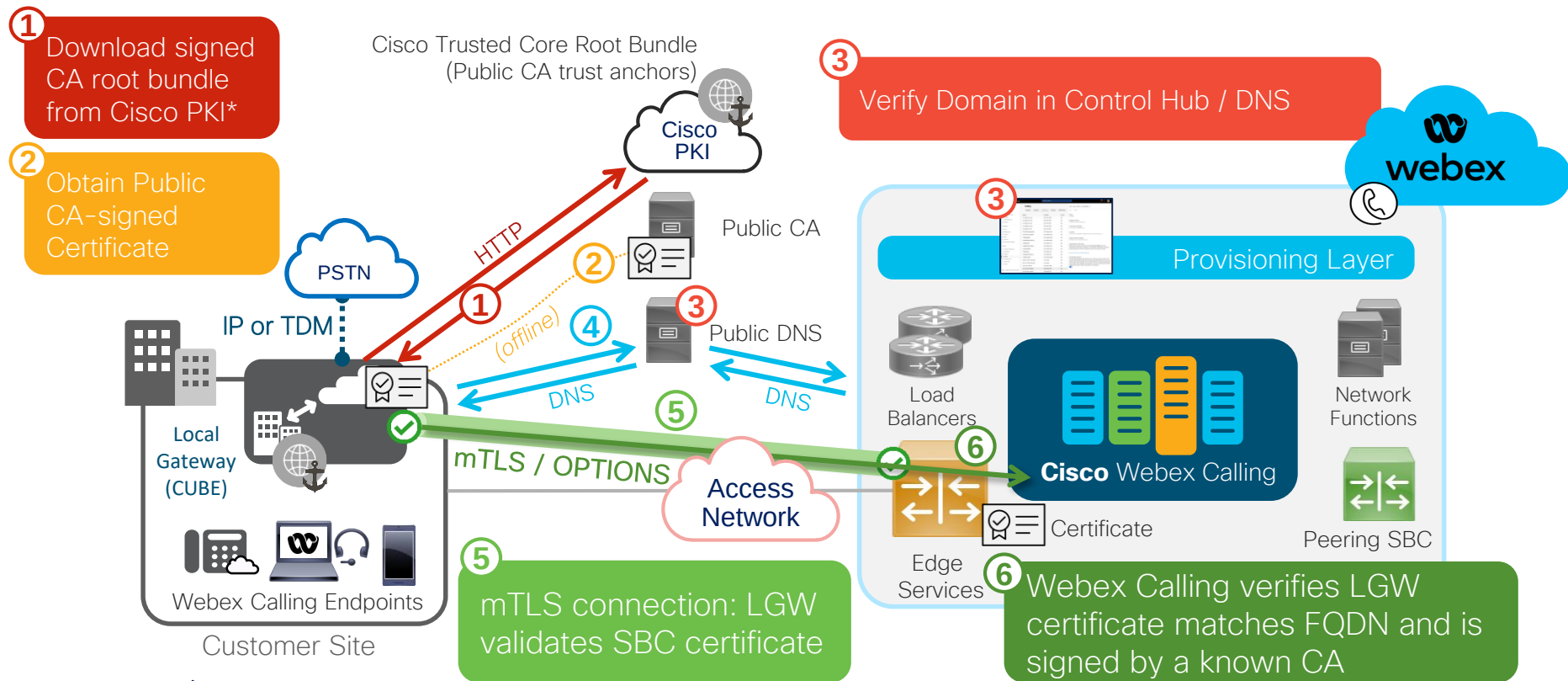
Response Error Code	Resolution
404 User Not Found	Check “number” configured under credentials is correct
401 Unauthorized	Check ”realm” is configured to “BroadWorks”
	Check “username”, “password” under credentials is correct
403 Authentication Failure	Check “username”, “password” under credentials is correct

Certificate- Based Local Gateway: Troubleshooting Peering



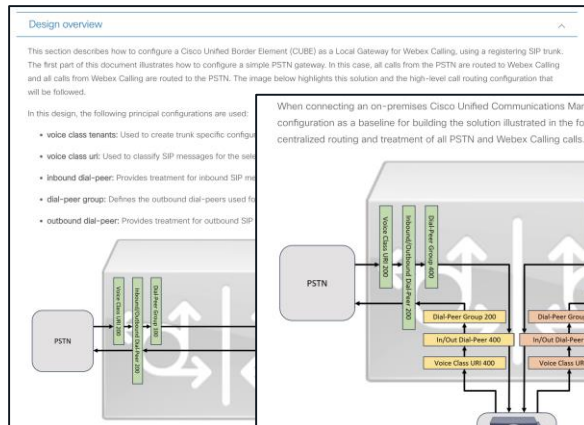
CUBE Onboarding and Registration

Certificate-Based Trunks

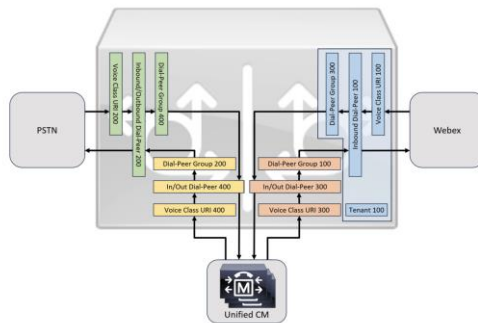


CUBE Configuration Guide

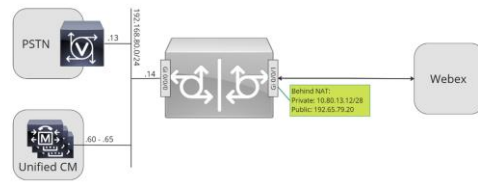
<https://help.webex.com/en-us/article/jr1i3r/Configure-Local-Gateway-on-IOS-XE-for-Webex-Calling>



When connecting an on-premises Cisco Unified Communications Manager solution with Webex Calling, you configure CUBE as a baseline for building the solution illustrated in the following diagram. In this case, Unified Communications Manager provides centralized routing and treatment of all PSTN and Webex Calling calls.



Throughout this document, the host names, IP addresses, and interfaces illustrated in the following image are used.



Configure Webex Calling registration-based trunk

- Create a registration based PSTN trunk for an existing location in Control Hub. Make a note of the trunk information that the trunk has been created. These details, as highlighted in the following illustration, will be used in the configuration. For more information, see [Configure trunks, route groups, and dial plans for Webex Calling](#).

Add Trunk

Dallas Successfully created.

Visit the Route group page to add trunks to a route group. Visit the Locations page to configure PSTN connections to individual locations. Visit the Dial Plans page to use this trunk as the routing choice for a dial plan.

Trunk Info

Trunk Info	Details
Trunk Name	Dallas171797921_LGU
Trunk Group	OT50703
Outbound Proxy Address	dfw04.sipconnect-us.bld.webex.com
Registrar Domain	98027369.us10.bld.webex.com

- Enter the following commands to configure CUBE as a Webex Calling Local Gateway.

```
voice service voip
ip address trusted list
ipv4 x.x.x.x y.y.y.y
mode border-element
media statistics
media bulk-stats
allow-connections sip to sip
no supplementary-service sip refer
stun
stun flowdata agent-id 1 boot-count 4
stun flowdata shared-secret @ Password1235
sip
```

Certificate-based Local Gateway

- Configure Webex Calling
- Create voice class trunk registration: tenant later will initiate

The following example uses the values illustrated in Step 1 for the purpose of this guide (shown in bold). Replace these with values for your trunk in your configuration.

```
voice class tenant 100
  registrar dns:98027369.us10.bld.webex.com scheme sips expires 240 refresh-ratio 50 tcp tls
  credentials number Dallas171797921_LGU username Dallas1463285401_LGU password @ 9W[M6iY+ realm BroadWorks
  authentication username Dallas1463285401_LGU password @ 9W[M6iY+ realm BroadWorks
  no remote-party-id
  sip-server dns:98027369.us10.bld.webex.com
  connection-reuse
  srtp-crypto 100
  session transport tcp tls
  url sips
  error-passthru
  asserted-id pal
  bind control source-interface GigabitEthernet0/0/1
  bind media source-interface GigabitEthernet0/0/1
  no pass-thru content custom-sdp
  sip-profiles 100
  outbound-proxy dns:dfw04.sipconnect-us.bld.webex.com
  privacy-policy passthru
```

Here's an explanation of the fields for the configuration:

voice class tenant 100

Defines a set of configuration parameters that will be used only for the Webex Calling trunk. For more information, see [voice class tenant](#).

Configuring 3rd Party SBCs

https://www.webex.com/content/dam/wbx/us/aag/webex_calling_third_party_sbc_support_cm-5753.pdf

Device Type

Select Device 



Cisco Unified Border Element

Oracle Session Border Controller

AudioCodes Session Border Control...

Ribbon Session Border Controller

Enter hostname

SBC Vendor	AudioCodes	
SBC models supported	• Mediant 500 Gateway & E-SBC • Mediant 800B/C Gateway & E-SBC • Mediant 1000B Gateway & E-SBC	
Software version supported	7.40A.250.440 or later	
Resources	• AudioCodes Cisco Community Post • Configure AudioCodes SBC • Contact AudioCodes	

SBC Vendor	Oracle	
SBC models supported	• AP 1100 • AP 3900 • AP 4600 • AP 6300 • AP 6350	
Software version supported	SBC 9.0 Software	
Resources	• Oracle Cisco Community Post • Configuration guide • Contact: cgbu_alliances_ww_grp@oracle.com	

SBC Vendor	Ribbon	
SBC models supported	- Supported today: • SBC Core 5000 Series • SBC Core 7000 • SBC Core SWe	- Certification planned for CY Q1 2023: • SBC Edge 1000 • SBC Edge 2000 • SBC SWeEdge
Software version supported	Ribbon SBC Core SWe V10.01.00	
Resources	• Ribbon Cisco Communities Post • Configure Ribbon Core SBC • Contact Ribbon	

Control Hub Status for Certificate-Based Trunks

Calling

[Numbers](#)[Locations](#)[Call Routing](#)[Features](#)[PSTN Orders](#)[Service Settings](#)[Client Settings](#)

[Trunk](#)[Route Group](#)[Dial Plans](#)[Verify Call Routing](#)[Zone](#)[Trusted Network Edge](#)

Trunk

SIP trunks provide connectivity to a customer-owned PSTN service and to an on-premises IP PBX deployment. These were previously accessed via the

Name	Location	Trunk Type	In Use
svs-rtp-cube7a	RTP	Registration based	Yes
svs-rtp-dmz-cube9a	RTP	Certificate based	No
Test	RTP	Registration based	Yes

svs-rtp-dmz-cube9a

[Trunk](#) > [Details](#)

Status ⓘ
● Offline
⚠ TLS connection and SIP options from Local Gateway to Webex Calling have failed. [Learn more](#)

Trunk Type
Certificate based

Device
Cisco Unified Border Element

FQDN
svs-rtp-dmz-cube9a.cube.ecatslab.com:5061

Max concurrent calls

Webex Calling edge proxy address (FQDN)
peering1.us.sipconnect.bclid.webex.com:5062
peering2.us.sipconnect.bclid.webex.com:5062
peering3.us.sipconnect.bclid.webex.com:5062
peering4.us.sipconnect.bclid.webex.com:5062

Webex Calling edge proxy address (SRV)
us01.sipconnect.bclid.webex.com

Control Hub Status for Certificate-Based Trunks

- Check Control Hub for status / warnings / errors

<https://help.webex.com/en-us/article/n0xb944/Configure-Trunks,-Route-Groups,-and-Dial-Plans-for-Webex-Calling>

Troubleshooting 		
SI No.	Error Description	Action
1.	TLS Connection to Local Gateway failed due to DNS resolution failure of the FQDN configured for your gateway	Verify the DNS configurations for the SRV /FQDN configured and ensure they are resolvable
2.	TLS Connection to Local Gateway failed due to a transport issue	Verify that the resolved IP addresses and port to the Local Gateway are valid

Control Hub Status for Certificate-Based Trunks

<https://help.webex.com/en-us/article/n0xb944/Configure-Trunks,-Route-Groups,-and-Dial-Plans-for-Webex-Calling>

TLS Connection to Local Gateway failed due to **DNS resolution failure of the FQDN** configured for your gateway

TLS Connection to Local Gateway failed due to a transport issue

TLS Connection to Local Gateway failed as the gateway's certificate is **signed by an invalid Certificate Authority**

TLS Connection to Local Gateway failed as the gateway's **certificate has expired**

TLS Connection to Local Gateway failed as the gateway's certificate has been issued by an **expired Certificate Authority**

TLS Connection to Local Gateway failed as the **FQDN configured for your gateway is missing from CN or SAN**

SIP options sent to the Local Gateway received **no response**

TLS connection from Local Gateway to Webex Calling failed due to an invalid gateway certificate

TLS connection from Local Gateway to Webex Calling failed as we were **unable to trust the Certificate Authority**

TLS connection from Local Gateway to Webex Calling failed due to **expired certificates in the chain**

TLS connection and SIP options from Local Gateway to Webex Calling have failed

SIP options response from the Local Gateway indicates a **Server error or Service Unavailable**

TLS Connection to Local Gateway failed as Local gateway's **certificate has been revoked**

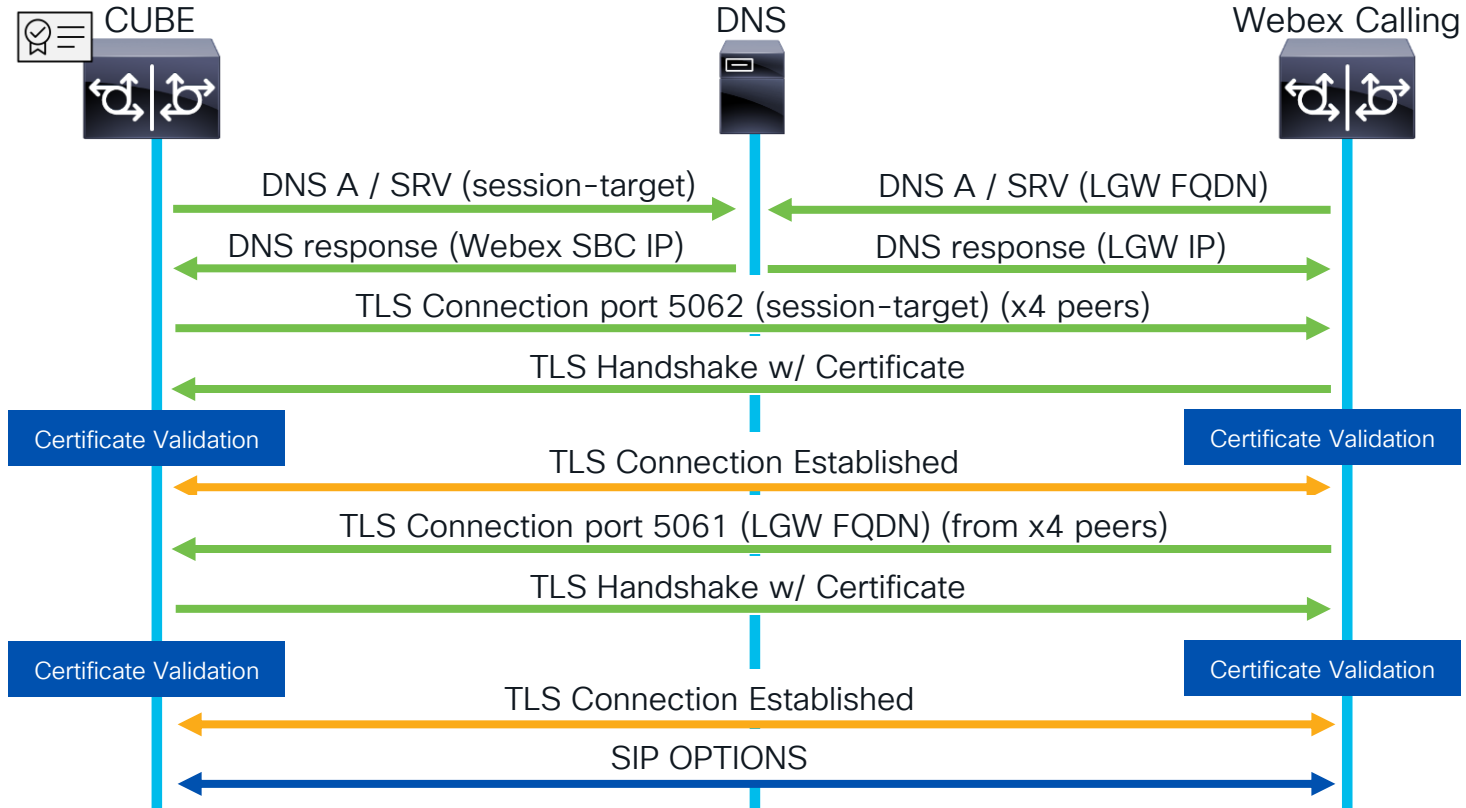
TLS Connection from Local Gateway to Webex Calling failed as the **gateway's certificate has been revoked**

TLS Connection from Local Gateway to Webex Calling failed as the **gateway's certificate has expired**

TLS Connection from Local Gateway to Webex Calling failed due to a certificate error

TLS Connection to Local Gateway from Webex Calling failed due to a certificate error

CUBE Certificated-Based Peering Process



Check TCP Session Establishment

```
svs-rtp-dmz-cube8a#show tcp brief numeric
```

TCB	Local Address	Foreign Address	(state)	
7F6EB38F1DB0	10.81.2.20.5060	172.18.106.58.41601	ESTAB	CUBE to UCM
7F6E47C940B8	10.81.2.20.5060	172.18.106.59.35575	ESTAB	
7F6EB38C24D8	10.81.2.20.5060	172.18.106.60.44110	ESTAB	
7F6EB38C12E8	64.102.250.137.5061	139.177.65.53.8934	ESTAB	WxC to CUBE
7F6E47E0BA68	64.102.250.137.5061	139.177.64.54.8934	ESTAB	
7F6E47E85BE8	64.102.250.137.5061	139.177.64.53.8934	ESTAB	
7F6E47E5BDC8	64.102.250.137.5061	139.177.65.54.8934	ESTAB	
7F6E47DE2CB0	64.102.250.137.21819	139.177.65.54.5062	ESTAB	CUBE to WxC
7F6E48DD75E0	64.102.250.137.11636	139.177.65.53.5062	ESTAB	
7F6E47E7FCB8	64.102.250.137.39113	139.177.64.53.5062	ESTAB	
7F6E47D92AD8	64.102.250.137.48188	139.177.64.54.5062	ESTAB	

Check TCP Session Establishment

```
svs-rtp-dmz-cube9a#deb ip tcp transactions port 5062
```

```
TCP special event debugging is on
```

```
*Nov 21 20:53:14.864: TCP: Setting Keepalive interval and retries to 60 and 4
```

```
*Nov 21 20:53:14.864: tcp_uniqueport: using ephemeral max 55000
```

```
*Nov 21 20:53:14.864: Reserved port 54086 in Transport Port Agent for TCP IP type 1
```

```
*Nov 21 20:53:14.864: TCP: sending SYN, seq 3703836424, ack 0
```

```
*Nov 21 20:53:14.864: TCP0: Connection to 135.84.175.164:5062, advertising MSS 536
```

```
*Nov 21 20:53:14.865: TCP0: state was CLOSED -> SYNSENT [54086 -> 135.84.175.164(5062)]
```

```
*Nov 21 20:53:14.891: Released port 54086 in Transport Port Agent for TCP IP type 1 delay 240000
```

```
*Nov 21 20:53:14.891: TCP0: state was SYNSENT -> CLOSED [54086 -> 135.84.175.164(5062)]
```

```
*Nov 21 20:53:14.891: TCP0: bad seg from 135.84.175.164 -- closing connection: port 54086 seq  
2075661766 ack 3703836425 rcvnxt 0 rcvwnd 0 len 0
```

```
*Nov 21 20:53:14.891: TCP0: connection closed - remote sent RST
```

```
*Nov 21 20:53:14.891: TCB7F6E47D97548 getting property TCP_VRFTABLEID (20)
```

```
*Nov 21 20:53:14.891: TCB 0x7F6E47D97548 destroyed
```

TLS Handshake Failure

- TLS Handshake failure will display a Syslog message:

```
Nov 22 21:45:31.712: %SIP-2-TLS_HANDSHAKE_FAILED: TLS handshake failure - remote_addr=139.177.64.53, remote_port=5062
```

- Control Hub will show TLS Connection errors on Trunk Configuration (**Calling** > **Call Routing** > **Trunk** > **Trunk Info**)

Status ⓘ

● Impaired

⚠ TLS Connection to Local Gateway failed as the gateway's certificate is signed by an invalid Certificate Authority. [Learn more](#)

Trunk Type

Certificate based

Verify Correct Certificate Configured

```
sip-ua
transport tcp tls v1.2
crypto signaling default trustpoint CUBE_CA_CERT
```

```
crypto pki trustpoint CUBE_CA_CERT
enrollment terminal pem
serial-number none
subject-name CN=svs-rtp-dmz-cube9a.cube.ecatslab.com
subject-alt-name svs-rtp-dmz-cube9a.cube.ecatslab.com
revocation-check none
rsa-keypair svs-rtp-dmz-cube9a
```

svs-rtp-dmz-cube9a

[Trunk](#) > [Details](#)

Status ⓘ

● Online

Trunk Type

Certificate based

Device

Cisco Unified Border Element

FQDN

svs-rtp-dmz-cube9a.cube.ecatslab.com:5061

Verify CA is trusted by Webex

```
svs-rtp-dmz-cube10a#show crypto pki certificates
```

Certificate

Status: Available

Certificate Serial Number (hex): 0091688E8646F2635DBD7F2EB791

Certificate Usage: General Purpose

Issuer:

cn=Sectigo RSA Domain Validation Secure Server CA

o=Sectigo Limited

l=Salford

st=Greater Manchester

c=GB

Subject:

Name: **svs-rtp-cube10a.cube.ecatslab.com**

cn=**svs-rtp-cube10a.cube.ecatslab.com**

Validity Date:

start date: 19:00:00 EST Dec 3 2023

end date: 18:59:59 EST Jan 3 2025

Associated Trustpoints: CUBE_CA_CERT

Storage: nvram:SectigoRSADo#208C.cer

svs-rtp-dmz-cube10a 

Trunk > Details

Status 

● Offline

TLS Connection to Local Gateway failed as the FQDN configured for your gateway is missing from CN or SAN. [Learn more](#)

Trunk Type

Certificate based

Device

Cisco Unified Border Element

FQDN

svs-rtp-dmz-cube10a.cube.ecatslab.com:5061

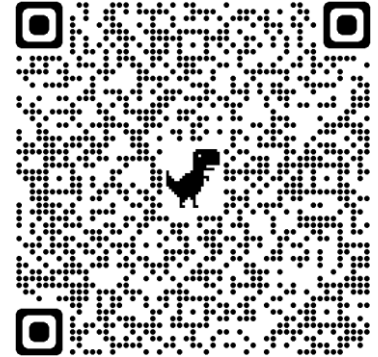
```
crypto pki trustpoint CUBE_CA_CERT
enrollment terminal pem
serial-number none
subject-name CN=svs-rtp-cube10a.cube.ecatslab.com
subject-alt-name svs-rtp-cube10a.cube.ecatslab.com
revocation-check none
rsa-keypair svs-rtp-dmz-cube10a
hash sha256
```

Verify CA is trusted by Webex

<https://help.webex.com/en-us/article/WBX9000008850/What-Root-Certificate-Authorities-are-Supported-for-Calls-to-Cisco-Webex-Audioand-Video-Platforms>

Supported Root Certificate Authorities:

Fingerprint (SHA1)	Subject	Date Added
b1bc968bd4f49d622aa89a81f2150152a41d829c	C=BE/O=GlobalSign nv-sa/OU=Root CA/CN=GlobalSign Root CA	January 1st, 2016
ca3afbcf1240364b44b216208880483919937cf7	C=BM/O=QuoVadis Limited/CN=QuoVadis Root CA 2	January 1st, 2016
590d2d7d884f402e617ea562321765cf17d894e9	C=DE/O=T-Systems Enterprise Services GmbH/OU=T-Systems Trust Center/CN=T-TeleSec GlobalRoot Class 3	January 1st, 2016



Verify CA is trusted by Webex

```
svs-rtp-dmz-cube9a#show crypto pki certificates
```

Certificate

```
Status: Available
Certificate Serial Number (hex): 00FADBC625153DAA0...
Certificate Usage: General Purpose
Issuer:
  cn=Sectigo RSA Domain Validation Secure Server CA
  o=Sectigo Limited
  l=Salford
  st=Greater Manchester
  c=GB
```

Subject:

```
Name: svs-rtp-dmz-cube9a.cube.ecatslab.com
cn=svs-rtp-dmz-cube9a.cube.ecatslab.com
```

Validity Date:

```
start date: 19:00:00 EST Nov 20 2022
end date: 18:59:59 EST Dec 22 2023
```

```
Associated Trustpoints: CUBE_CA_CERT
```

```
Storage: nvram:SectigoRSADo#A910.cer
```

svs-rtp-dmz-cube9a

[Trunk](#) > [Details](#)

Status ⓘ

● Online

Trunk Type

Certificate based

Device

Cisco Unified Border Element

FQDN

svs-rtp-dmz-cube9a.cube.ecatslab.com:5061

Verify CA is trusted by Webex

```
svs-rtp-dmz-cube9a#show crypto pki certificates
```

Certificate

Status: Available
Certificate Serial Number (hex): 00FADBC625153DAA0...
Certificate Usage: General Purpose

Issuer:

cn=Sectigo RSA Domain Validation Secure Server CA
o=Sectigo Limited
l=Salford
st=Greater Manchester
c=GB

Subject:

Name: **svs-rtp-dmz-cube9a.cube.ecatslab.com**
cn=svs-rtp-dmz-cube9a.cube.ecatslab.com

Validity Date:

start date: 19:00:00 EST Nov 20 2022
end date: 18:59:59 EST Dec 22 2023

Associated Trustpoints: CUBE_CA_CERT

Storage: nvram:SectigoRSADo#A910.cer

CA Certificate

Status: Available
Certificate Serial Number (hex): 7D5B51...
Certificate Usage: Signature
Issuer:

cn=USERTrust RSA Certification Authority
o=The USERTRUST Network
l=Jersey City
st=New Jersey
c=US

Subject:

cn=Sectigo RSA Domain Validation Secure Server CA
o=Sectigo Limited
l=Salford
st=Greater Manchester
c=GB

CRL Distribution Points:

<http://crl.usertrust.com/USERTrustRSA>

Validity Date:

start date: 20:00:00 EDT Nov 1 2018
end date: 18:59:59 EST Dec 31 2030

Associated Trustpoints: CUBE_CA_CERT

Storage: nvram:USERTrustRSA#DA7CA.cer

Verify CA is trusted by Webex

CA Certificate

Status: Available
Certificate Serial Number (hex): 7D5B5126B476BA11DB7...
Certificate Usage: Signature
Issuer:
cn=**USERTrust RSA Certification Authority**
o=The USERTRUST Network
l=Jersey City
st=New Jersey
c=US

Subject:
cn=**Sectigo RSA Domain Validation Secure Server CA**
o=Sectigo Limited
l=Salford
st=Greater Manchester
c=GB
CRL Distribution Points:
<http://crl.usertrust.com/USERTrustRSACertification...>
Validity Date:
start date: 20:00:00 EDT Nov 1 2018
end date: 18:59:59 EST Dec 31 2030
Associated Trustpoints: CUBE_CA_CERT Intermediate_CA2
Storage: nvram:USERTrustRSA#DA7CA.cer

CA Certificate

Status: Available
Certificate Serial Number (hex): 3972...
Certificate Usage: Signature
Issuer:
cn=AAA Certificate Services
o=Comodo CA Limited
l=Salford
st=Greater Manchester
c=GB
Subject:
cn=**USERTrust RSA Certification Authority**
o=The USERTRUST Network
l=Jersey City
st=New Jersey
c=US
CRL Distribution Points:
<http://crl.comodoca.com/AAACertific...>
Validity Date:
start date: 20:00:00 EDT Mar 11 201...
end date: 18:59:59 EST Dec 31 202...
Associated Trustpoints: Intermediate_...
Storage: nvram:AAACertifica#3595CA.ce...

Verify CA is trusted by Webex

CA Certificate

Status: Available
Certificate Serial Number (hex): 3972443AF922B751D...
Certificate Usage: Signature
Issuer:

cn=**AAA Certificate Services**
o=Comodo CA Limited
l=Salford
st=Greater Manchester
c=GB

Subject:

cn=**USERTrust RSA Certification Authority**
o=The USERTRUST Network
l=Jersey City
st=New Jersey
c=US

CRL Distribution Points:

<http://crl.comodoca.com/AAACertificateServices.crl>

Validity Date:

start date: 20:00:00 EDT Mar 11 2019
end date: 18:59:59 EST Dec 31 2028

Associated Trustpoints: Intermediate_CA

Storage: nvram:AAACertifica#3595CA.cer

CA Certificate

Status: Available
Certificate Serial Number (hex): 01
Certificate Usage: Signature
Issuer:

cn=**AAA Certificate Services**
o=Comodo CA Limited
l=Salford
st=Greater Manchester
c=GB

Subject:

cn=**AAA Certificate Services**
o=Comodo CA Limited
l=Salford
st=Greater Manchester
c=GB

CRL Distribution Points:

<http://crl.comodoca.com/AAACertificateServices.crl>
<http://crl.comodo.net/AAACertificateServices.crl>

Validity Date:

start date: 19:00:00 EST Dec 31 2002
end date: 18:59:59 EST Dec 31 2028

Associated Trustpoints: Root_CA_CERT

Storage: nvram:AAACertifica#1CA.cer

Verify CA is trusted by Webex

CA Certificate

Status: Available

Certificate Serial Number (hex): 01

Certificate Usage: Signature

Issuer:

cn=**AAA Certificate Services**
o=Comodo CA Limited
l=Salford
st=Greater Manchester
c=GB

Subject:

cn=**AAA Certificate Services**
o=Comodo CA Limited
l=Salford
st=Greater Manchester
c=GB



Self-signed indicates Root CA

CRL Distribution Points:

<http://crl.comodoca.com/AAACertificateServices.crl>

<http://crl.comodo.net/AAACertificateServices.crl>

Validity Date:

start date: 19:00:00 EST Dec 31 2003

end date: 18:59:59 EST Dec 31 2028

Associated Trustpoints: **Root_CA_CERT**



show crypto pki trustpoints Root_CA_CERT status

Verify CA is trusted by Webex

Associated Trustpoints: **Root_CA_CERT**

```
svs-rtp-dmz-cube9a#show crypto pki trustpoints Root_CA_CERT status
```

Trustpoint Root_CA_CERT:

Issuing CA certificate configured:

Subject Name:

cn=AAA Certificate Services,o=Comodo CA Limited,l=Salford,st=Greater Manchester,c=GB

Fingerprint MD5: 497904B0 EB8719AC 47B0BC11 519B74D0

Fingerprint SHA1: D1EB23A4 6D17D68F D92564C2 F1F16017 64D8E349

State:

Keys generated No

Issuing CA authenticated Yes

Certificate request(s) None

<https://help.webex.com/en-us/article/WBX9000008850/What-Root-Certificate-Authorities-are-Supported-for-Calls-to-Cisco-Webex-Audioand-Video-Platforms>

d1eb23a46d17d68fd92564c2f1f1601764d8e349	C=GB/ST=Greater Manchester/L=Salford/O=Comodo CA Limited/CN=AAA Certificate Services	August 3, 2018
--	--	----------------------

Verify TLS Connections

```
svs-rtsp-dmz-cube9a#show sip-ua connections tcp tls detail
```

```
Total active connections      : 8
No. of send failures          : 4
No. of remote closures        : 105
No. of conn. failures         : 1595
No. of inactive conn. ageouts : 0
Max. tls send msg queue size of 3, recorded for 139.177.65.53:8934
TLS client handshake failures : 0
TLS server handshake failures : 0
```

```
Remote-Agent:139.177.65.54, Connections-Count:2
```

Remote-Port	Conn-Id	Conn-State	WriteQ-Size	Local-Address	TLS-Version	Cipher	Curve	Tenant
5062	1658	Established	0	64.102.250.137:21819	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0
8934	1715	Established	0	64.102.250.137:5061	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0

```
Remote-Agent:139.177.64.53, Connections-Count:2
```

Remote-Port	Conn-Id	Conn-State	WriteQ-Size	Local-Address	TLS-Version	Cipher	Curve	Tenant
5062	1657	Established	0	64.102.250.137:39113	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0
8934	1717	Established	0	64.102.250.137:5061	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0

```
Remote-Agent:139.177.64.54, Connections-Count:2
```

Remote-Port	Conn-Id	Conn-State	WriteQ-Size	Local-Address	TLS-Version	Cipher	Curve	Tenant
5062	1659	Established	0	64.102.250.137:48188	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0
8934	1714	Established	0	64.102.250.137:5061	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0

```
Remote-Agent:139.177.65.53, Connections-Count:2
```

Remote-Port	Conn-Id	Conn-State	WriteQ-Size	Local-Address	TLS-Version	Cipher	Curve	Tenant
5062	1660	Established	0	64.102.250.137:11636	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0
8934	1716	Established	0	64.102.250.137:5061	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0

Verify TLS Connections

```
svs-rtp-dmz-cubel0a#show sip-ua connections tcp tls detail
```

```
Total active connections      : 4
No. of send failures          : 1
No. of remote closures        : 24
No. of conn. failures         : 3579
No. of inactive conn. ageouts : 0
Max. tls send msg queue size of 1, recorded for 139.177.65.171:5062
TLS client handshake failures : 0
TLS server handshake failures : 0
```

```
Remote-Agent:139.177.65.171, Connections-Count:0
```

```
Remote-Agent:139.177.64.177, Connections-Count:2
```

Remote-Port	Conn-Id	Conn-State	WriteQ-Size	Local-Address	TLS-Version	Cipher	Curve	Tenant
5062	10	Established	0	64.102.250.130:30451	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0
8934	35	Established	0	64.102.250.130:5061	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0

```
Remote-Agent:139.177.65.147, Connections-Count:0
```

```
Remote-Agent:139.177.64.156, Connections-Count:2
```

Remote-Port	Conn-Id	Conn-State	WriteQ-Size	Local-Address	TLS-Version	Cipher	Curve	Tenant
5062	11	Established	0	64.102.250.130:15251	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0
8934	36	Established	0	64.102.250.130:5061	TLSv1.2	ECDHE-RSA-AES256-GCM-SHA384	P-256	0

status.webex.com



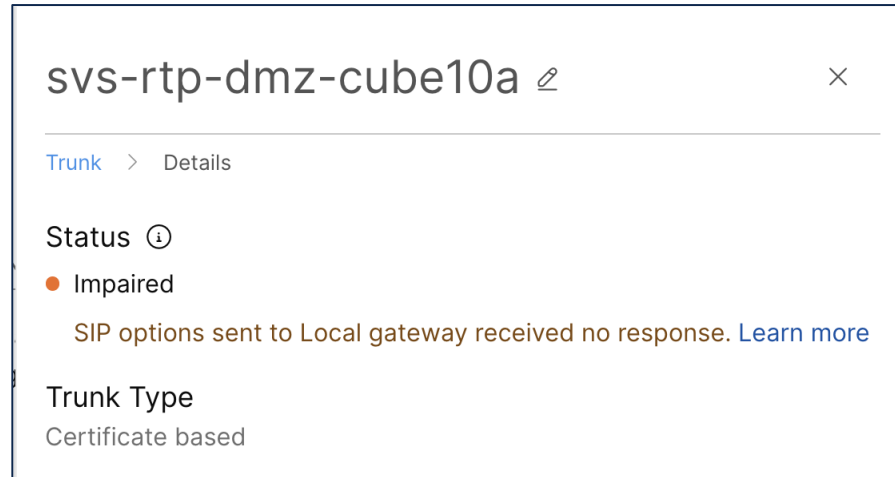
Open Incidents

⚠ Webex Meetings: New York Data Center Extended Service Maintenance: May 31, 2024



Verify OPTIONS Pings in both directions

- Webex Calling must see OPTIONS from Local Gateway to Webex Calling and must successfully receive responses to OPTIONS sent by Webex Calling to CUBE



CUBE not responding to OPTIONS

CUBE#**debug ccsip all**

*Jun 3 01:58:05.255: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:

Received:

OPTIONS sip:64.102.250.135:5061;transport=tls SIP/2.0

Via:SIP/2.0/TLS 139.177.65.12:8934;branch=z9hG4bKBroadworksSSE.-64.102.250.135V11176-0-100-1997318647-1654221506418-

From:<sip:139.177.65.12>;tag=1997318647-1654221506418-

To:<sip:64.102.250.135>

Call-ID:SSE015826418030622-1947046482@139.177.65.12

CSeq:100 OPTIONS

Max-Forwards:0

Content-Length:0

*Jun 3 01:58:05.255: //-1/xxxxxxxxxxxx/SIP/Info/verbose/4096/ccsip_new_msg_preprocessor: Checking Invite Dialog

*Jun 3 01:58:05.260: //-1/xxxxxxxxxxxx/SIP/Info/verbose/8192/sipSPIIpTrustSilentDiscard: sipSPIIpTrustSilentDiscard: called for method [101]

*Jun 3 01:58:05.260: //-1/xxxxxxxxxxxx/SIP/Info/info/8192/**sipSPIIpTrustSilentDiscard: Message from untrusted ip address. Silently discard**

CUBE not responding to OPTIONS

```
voice service voip
ip address trusted list
ipv4 172.18.106.0 255.255.255.0
ipv4 139.177.72.0 255.255.254.0
ipv4 23.89.1.128 255.255.255.128
ipv4 23.89.33.0 255.255.255.0
ipv4 23.89.40.0 255.255.255.128
ipv4 23.89.76.128 255.255.255.128
ipv4 52.26.82.0 255.255.255.0
ipv4 85.119.56.0 255.255.254.0
ipv4 128.177.14.0 255.255.255.0
ipv4 128.177.36.0 255.255.255.0
ipv4 135.84.168.0 255.255.248.0
ipv4 139.177.64.0 255.255.248.0
ipv4 150.253.209.128 255.255.255.128
ipv4 170.72.0.128 255.255.255.128
ipv4 170.72.17.128 255.255.255.128
ipv4 170.72.29.0 255.255.255.0
ipv4 170.72.82.0 255.255.255.128
ipv4 185.115.196.0 255.255.252.0
ipv4 199.19.196.0 255.255.254.0
ipv4 199.19.199.0 255.255.255.0
ipv4 199.59.64.0 255.255.248.0
```

IP Subnets for Webex Calling Services

23.89.1.128/25	23.89.33.0/24	23.89.40.0/25
23.89.76.128/25	52.26.82.54/24	85.119.56.0/23
128.177.14.0/24	128.177.36.0/24	135.84.168.0/21
139.177.64.0/21	139.177.72.0/23	150.253.209.128/25
170.72.0.128/25	170.72.17.128/25	170.72.29.0/24
170.72.82.0/25	185.115.196.0/22	199.19.196.0/23
199.19.199.0/24	199.59.64.0/21	

<https://help.webex.com/en-us/article/b2exve/Port-Reference-Information-for-Cisco-Webex-Calling>



Webex Calling not responding to OPTIONS

```
CUBE#sh dial-peer voice summary
```

```
dial-peer hunt 0
```

		AD				PRE	PASS	SESS-SER-GRP\	OUT			
TAG	TYPE	MIN	OPER	PREFIX	DEST-PATTERN	FER	THRU	SESS-TARGET	STAT	PORT	KEEPALIVE	VRF
101	voip	up	up		BAD.BAD	0	syst	dns:peering1.us.sipc			busyout	NA
102	voip	up	up		BAD.BAD	0	syst	dns:peering2.us.sipc			busyout	NA
103	voip	up	up		BAD.BAD	0	syst	dns:peering3.us.sipc			busyout	NA
104	voip	up	up		BAD.BAD	0	syst	dns:peering4.us.sipc			busyout	NA

```
CUBE#debug ccsip messages
```

```
CUBE#debug ccsip non-call
```

```
May 31 2024 17:54:40.707 UTC: //267/000000000000/SIP/Msg/ccsipDisplayMsg:
```

```
Sent:
```

```
OPTIONS sip:139.177.65.147:5062 SIP/2.0
```

```
Via: SIP/2.0/TLS 64.102.250.130:5061;branch=z9hG4bK96711
```

```
From: <sip:64.102.250.130>;tag=AA693-481
```

```
To: <sip:139.177.65.147>
```

```
Date: Fri, 31 May 2024 17:54:40 GMT
```

```
Call-ID: B0417309-1EAD11EF-80FAD001-1BEE50AD@64.102.250.130
```

```
User-Agent: Cisco-SIPGateway/IOS-17.12.2
```

```
Max-Forwards: 70
```

```
CSeq: 101 OPTIONS
```

```
Contact: <sip:64.102.250.130:5061;transport=tl>
```

```
Content-Length: 0
```

Webex Calling not responding to OPTIONS

```
CUBE#sh dial-peer voice summary
```

```
dial-peer hunt 0
```

TAG	TYPE	MIN	OPER	PREFIX	DEST-PATTERN	PRE FER	PASS THRU	SESS-SER-GRP\ SESS-TARGET	OUT STAT	PORT	KEEPALIVE	VRF
101	voip	up	up		BAD.BAD	0	syst	dns:peering1.us.sipc			busyout	NA
102	voip	up	up		BAD.BAD	0	syst	dns:peering2.us.sipc			busyout	NA
103	voip	up	up		BAD.BAD	0	syst	dns:peering3.us.sipc			busyout	NA
104	voip	up	up		BAD.BAD	0	syst	dns:peering4.us.sipc			busyout	NA

```
CUBE#debug ccsip messages
```

```
CUBE#debug ccsip non-call
```

```
May 31 2024 17:54:40.707 UTC: //267/000000000000/SIP/Msg/ccsipDisplayMsg:
```

```
Sent:
```

```
OPTIONS sip:139.177.65.147:5062 SIP/2.0
```

```
Via: SIP/2.0/TLS 64.102.250.130:5061;branch=z9hG4bK96711
```

```
From: <sip:64.102.250.130>;tag=AA693-481
```

```
To: <sip:139.177.65.147>
```

```
Date: Fri, 31 May 2024 17:54:40 GMT
```

```
Call-ID: B0417309-1EAD11EF-80FAD001-1BEE50AD@64.102.250.130
```

```
User-Agent: Cisco-SIPGateway/IOS-17.12.2
```

```
Max-Forwards: 70
```

```
CSeq: 101 OPTIONS
```

```
Contact: <sip:64.102.250.130:5061;transport=tls>
```

```
Content-Length: 0
```

Contact Header MUST contain the
FQDN that matches TLS certificate

Webex Calling not responding to OPTIONS

```
CUBE#sh dial-peer voice summary
```

```
dial-peer hunt 0
```

		AD				PRE	PASS	SESS-SER-GRP\	OUT			
TAG	TYPE	MIN	OPER	PREFIX	DEST-PATTERN	FER	THRU	SESS-TARGET	STAT	PORT	KEEPALIVE	VRF
101	voip	up	up		BAD.BAD	0	syst	dns:peering1.us.sipc			busyout	NA
102	voip	up	up		BAD.BAD	0	syst	dns:peering2.us.sipc			busyout	NA
103	voip	up	up		BAD.BAD	0	syst	dns:peering3.us.sipc			busyout	NA
104	voip	up	up		BAD.BAD	0	syst	dns:peering4.us.sipc			busyout	NA

```
voice class sip-profiles 115
```

```
rule 10 request OPTIONS sip-header Contact modify "<sip:.*:" "<sip:svs-rtp-dmz-cube10a.cube.ecatslab.com:"
```

```
voice class sip-options-keepalive 100
```

```
description OPTIONS to Webex Calling
```

```
up-interval 5
```

```
transport tcp tls
```

```
sip-profiles 115
```

```
dial-peer voice 101 voip
```

```
voice-class sip options-keepalive profile 100
```

Webex Calling not responding to OPTIONS

```
CUBE#sh dial-peer voice summary
```

```
dial-peer hunt 0
```

TAG	TYPE	MIN	OPER	PREFIX	DEST-PATTERN	PRE FER	PASS THRU	SESS-SER-GRP\ SESS-TARGET	OUT STAT	PORT	KEEPALIVE	VRF
101	voip	up	up		BAD.BAD	0	syst	dns:peering1.us.sipc			active	NA
102	voip	up	up		BAD.BAD	0	syst	dns:peering2.us.sipc			active	NA
103	voip	up	up		BAD.BAD	0	syst	dns:peering3.us.sipc			active	NA
104	voip	up	up		BAD.BAD	0	syst	dns:peering4.us.sipc			active	NA

```
CUBE#debug ccsip messages
```

```
CUBE#debug ccsip non-call
```

```
May 31 2024 18:00:25.914 UTC: //422/000000000000/SIP/Msg/ccsipDisplayMsg:
```

```
Sent:
```

```
OPTIONS sip:139.177.64.177:5062 SIP/2.0
```

```
Via: SIP/2.0/TLS 64.102.250.130:5061;branch=z9hG4bKF3F06
```

```
From: <sip:64.102.250.130>;tag=FEB0D-12DB
```

```
To: <sip:139.177.64.177>
```

```
Date: Fri, 31 May 2024 18:00:25 GMT
```

```
Call-ID: 7E04507F-1EAE11EF-818ED001-1BEE50AD@64.102.250.130
```

```
User-Agent: Cisco-SIPGateway/IOS-17.12.2
```

```
Max-Forwards: 70
```

```
CSeq: 101 OPTIONS
```

```
Contact: <sip:svs-rtp-dmz-cube10a.cube.ecatslab.com:5061;transport=tls>
```

```
Content-Length: 0
```

Successful Connection from Control Hub

svs-rtp-dmz-cube9a 

Trunk > Details

Status 

Online

Trunk Type

Certificate based

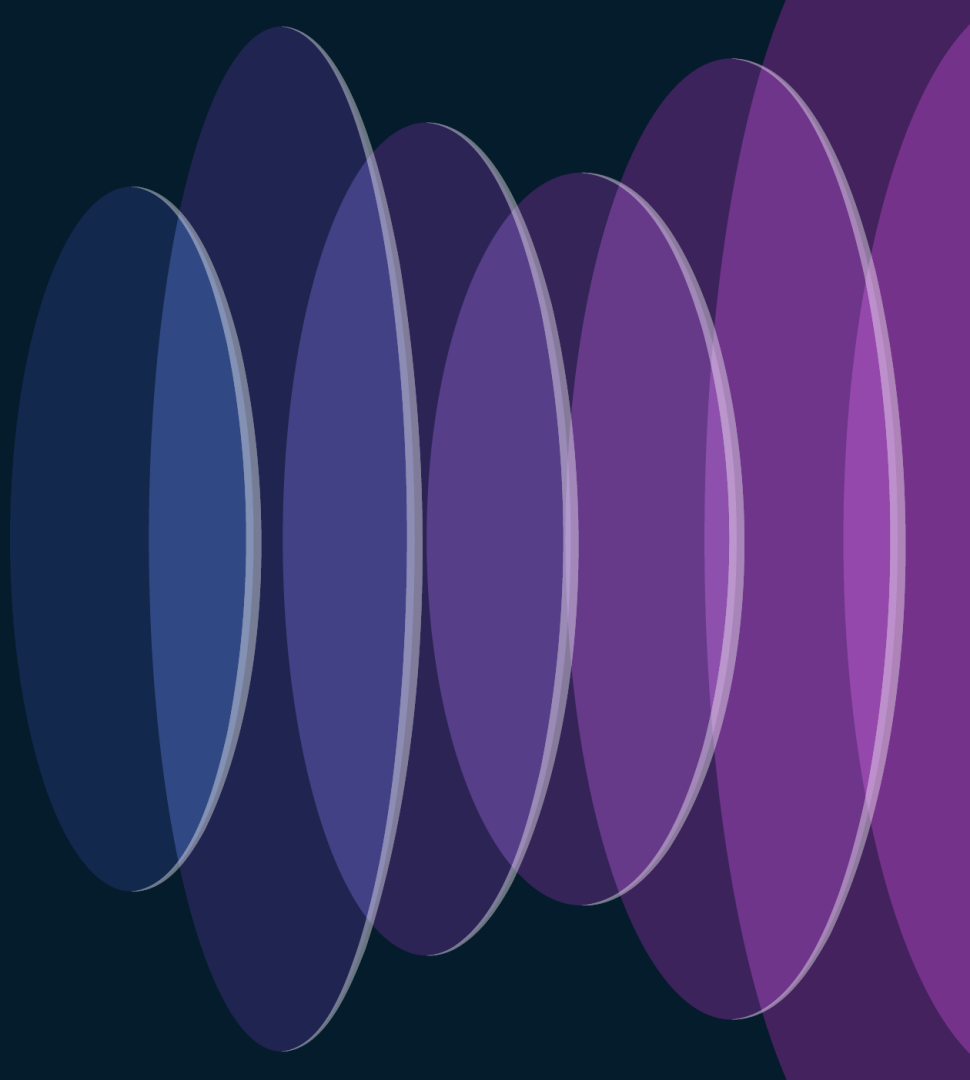
Device

Cisco Unified Border Element

FQDN

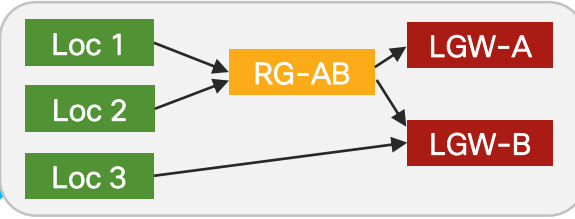
svs-rtp-dmz-cube9a.cube.ecatslab.com:5061

CUBE Call Routing



Premises-based PSTN Deployment Models

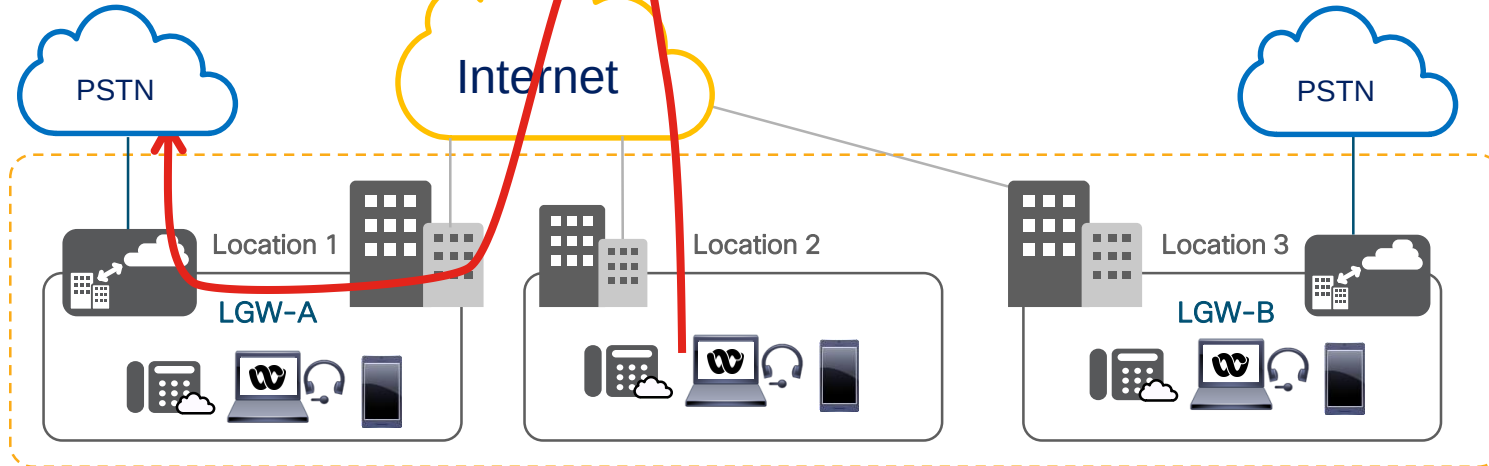
Multi-site with Multiple Local Gateways



Control Hub configuration

Multiple locations can use the same Trunk / Route Group

One Trunk or Route Group must be assigned to each location



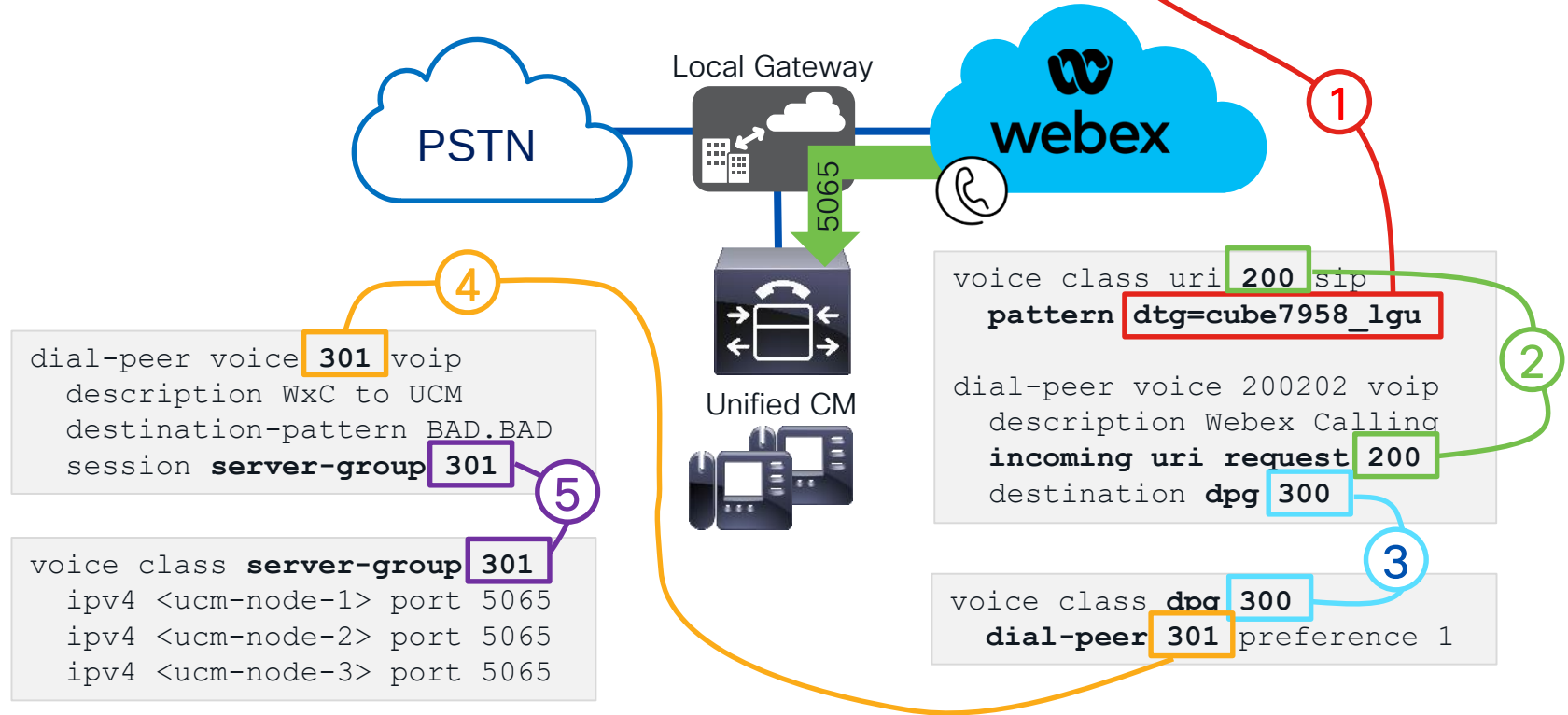
PSTN Connection and Main Number selection

Calling > Locations > Select Location

Calling connection	PSTN connection ⓘ	Premises-based PSTN	Manage	←	▼
	Main number ⓘ	Select a number ▼ ←			
		⚠ You will not be able to make or receive calls until this number is added			
Emergency calling	Callback number ⓘ	⚠ This Location's main number not selected.			>
	Emergency call notification ⓘ	Off	>		
	Enhanced emergency calling ⓘ ⚠	Off	>		

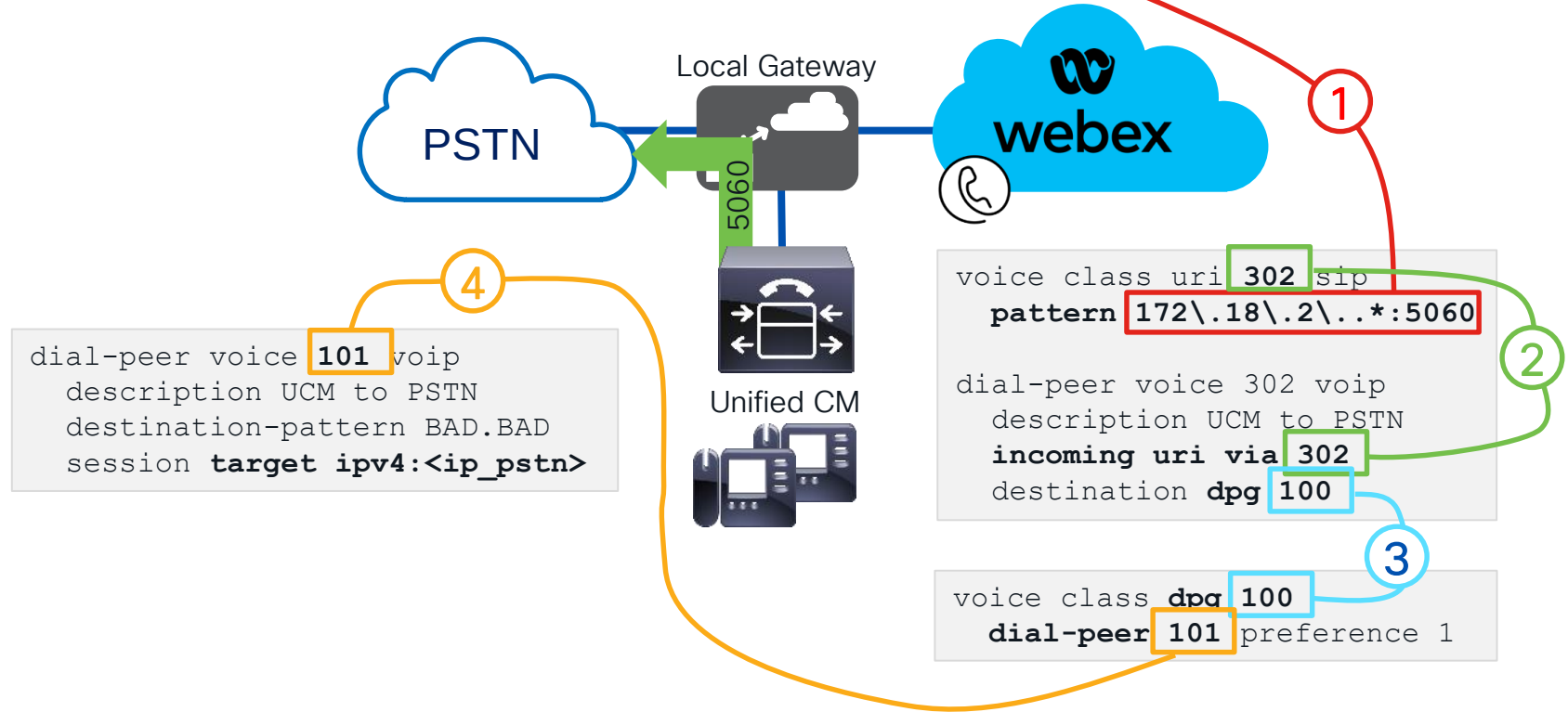
Dial Peer Matching

```
INVITE sip:+18008001180@64.102.250.133:5061;  
transport=tls;dtg=cube7958_lgu SIP/2.0
```



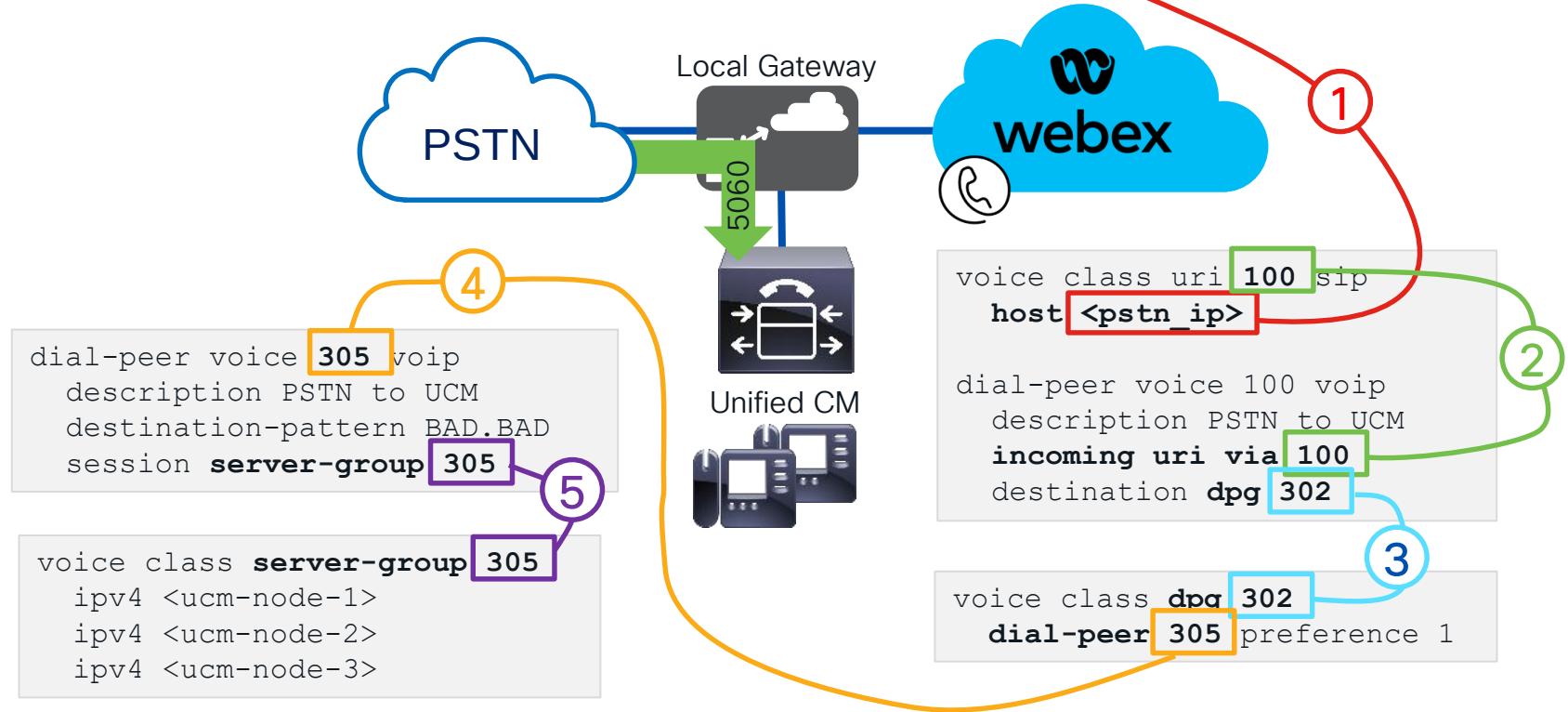
Dial Peer Matching

```
INVITE sip:+18008001180@172.19.54.10:5060;transport=...  
Via: SIP/2.0/TCP 172.18.2.20:5060 branch=z9hG4bK247e...
```



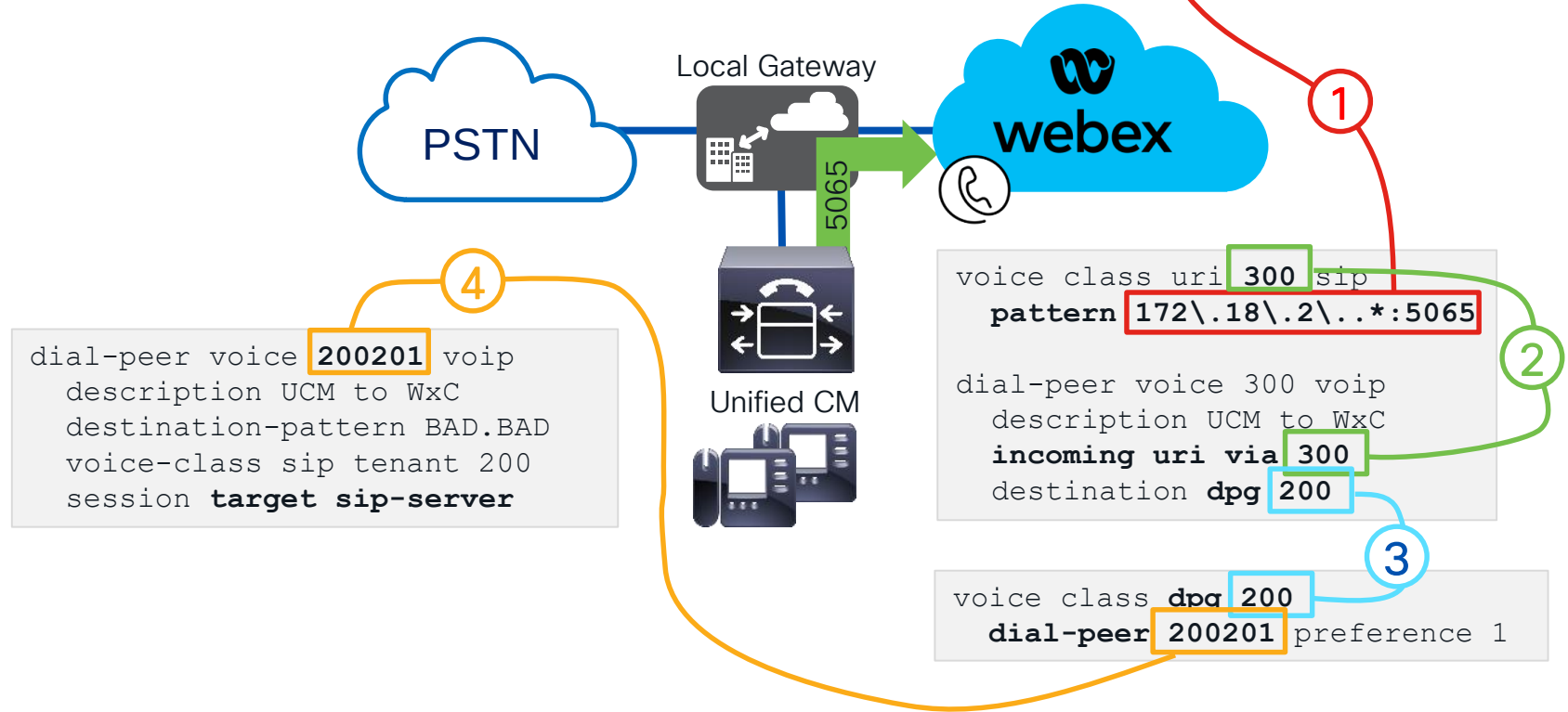
Dial Peer Matching

```
INVITE sip:+19195552345@64.102.2.123:5060;transport=...  
Via: SIP/2.0/TCP <pstn_ip>:5060;branch=z9hG4bK247e...
```



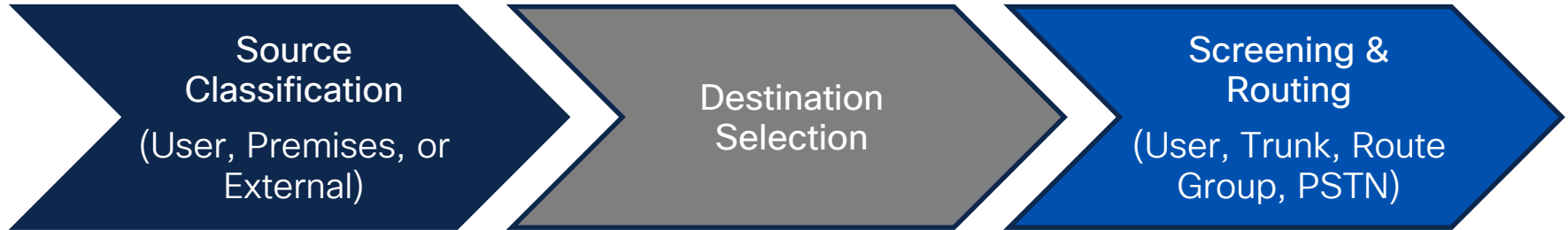
Dial Peer Matching

```
INVITE sip:+19195552345@86194638.us10.bcld.webex.com...  
Via: SIP/2.0/TCP 172.18.2.20:5065 branch=z9hG4bK247e...
```



Webex Calling call routing overview

- Call Routing undergoes three distinct phases

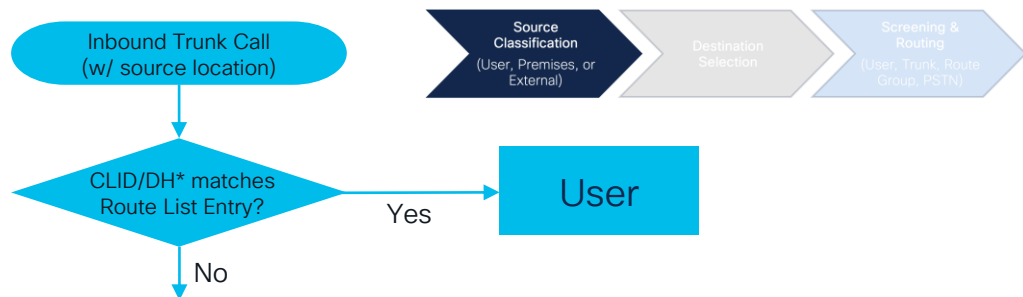


Source Classification



Source Classification

NOTE: Call must come in on trunk pointing to route list



Number in Diversion header used if present, if not number in From header is used

```

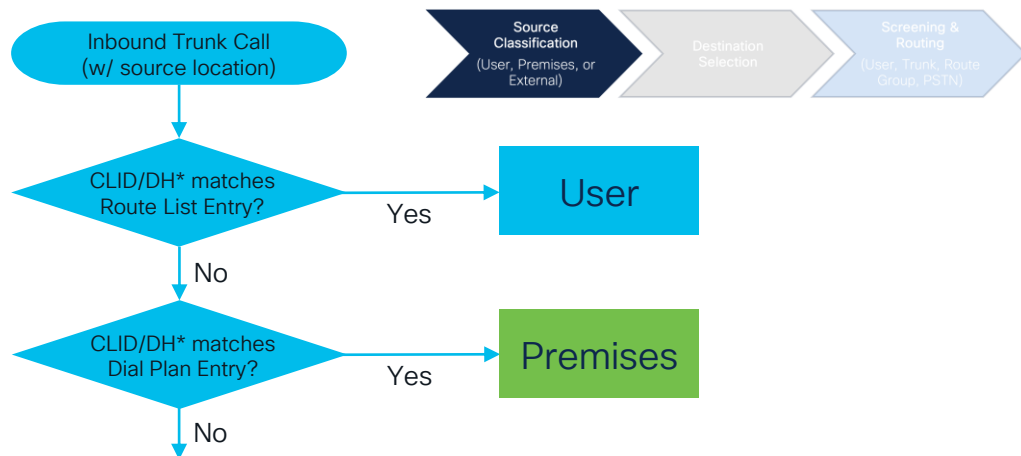
INVITE sip:89943702@peering3.us.sipconnect.bclld.webex.com:5062 SIP/2.0
Via: SIP/2.0/TLS 64.102.250.137:5061;branch=z9hG4bK8BF831C1E
From: <sip:+19194766200@64.102.250.137>;tag=FD340CF9-200D
To: <sip:89943702@peering3.us.sipconnect.bclld.webex.com>
Call-ID: 2EB7BD48-EF7111ED-B8429147-F554AD62@64.102.250.137
Supported: timer,resource-priority,replaces
Min-SE: 1800
User-Agent: Cisco-SIPGateway/IOS-17.10.1a
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY, INFO, REGISTER
CSeq: 101 INVITE
Contact: <sip:+19194766200@svs-rtp-dmz-cube9a.cube.ecatslab.com:5061;transport=tls>
Diversion: <sip:89915678@svs-rtp-dmz-cube9a.cube.ecatslab.com>
Expires: 180
Max-Forwards: 68
... snip ...

```

* CLID = Calling Party ID
DH = SIP Diversion Header

Source Classification

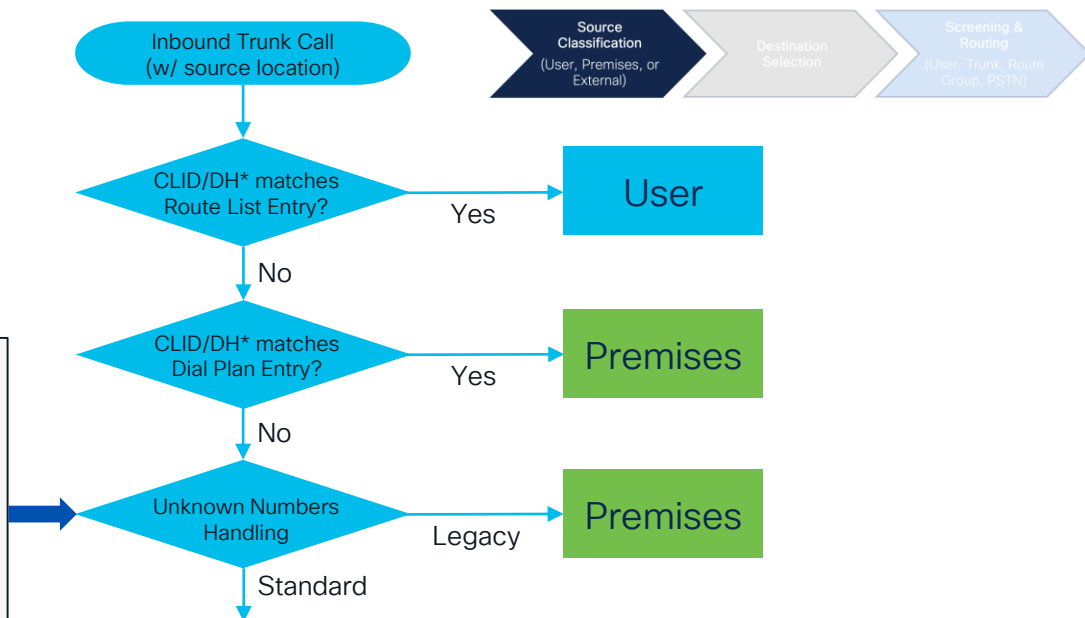
NOTE: Call must come in on trunk pointing to dial plan



Source Classification

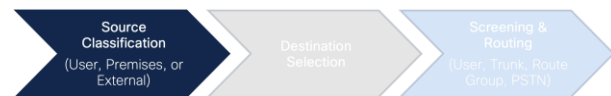
Org-wide Configuration

- ☒ Standard behavior
This is the default and recommended option to achieve the best level of interoperability with an on-premises PBX.
[Show Details](#) ▾
- ☐ Legacy behavior (not recommended)
This option provides backwards compatibility for the legacy Local Gateway behavior and is not recommended when Dial Plans are configured for the organization.



* CLID = Calling Party ID
DH = SIP Diversion Header

Source Classification



Org-wide Configuration

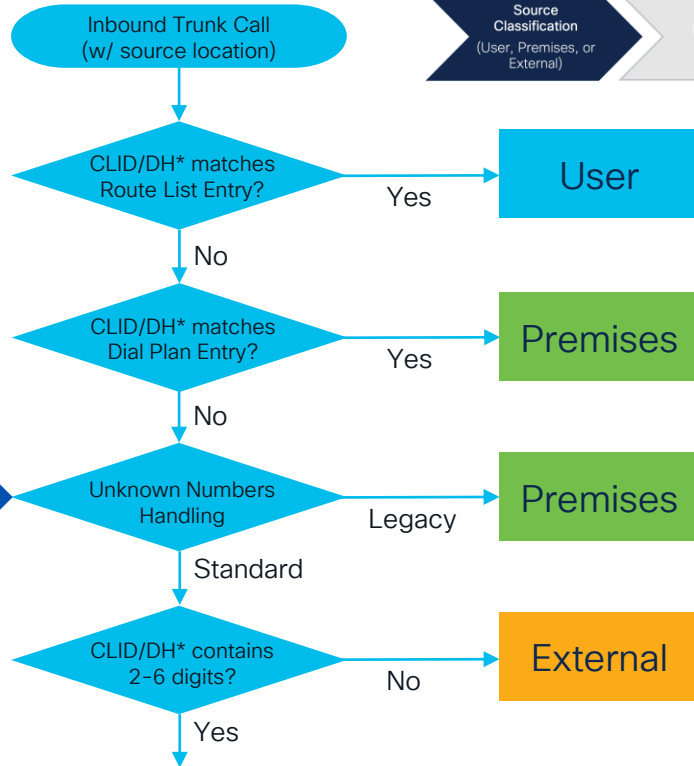
☒ Standard behavior

This is the default and recommended option to achieve the best level of interoperability with an on-premises PBX.

[Show Details](#) ▾

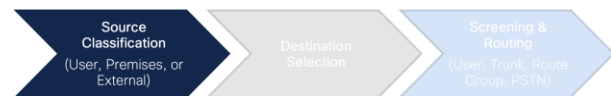
☐ Legacy behavior (not recommended)

This option provides backwards compatibility for the legacy Local Gateway behavior and is not recommended when Dial Plans are configured for the organization.



* CLID = Calling Party ID
DH = SIP Diversion Header

Source Classification



Org-wide Configuration

- ☒ **Standard behavior**
This is the default and recommended option to achieve the best level of interoperability with an on-premises PBX.
[Show Details](#) ▾
- ☐ **Legacy behavior (not recommended)**
This option provides backwards compatibility for the legacy Local Gateway behavior and is not recommended when Dial Plans are configured for the organization.

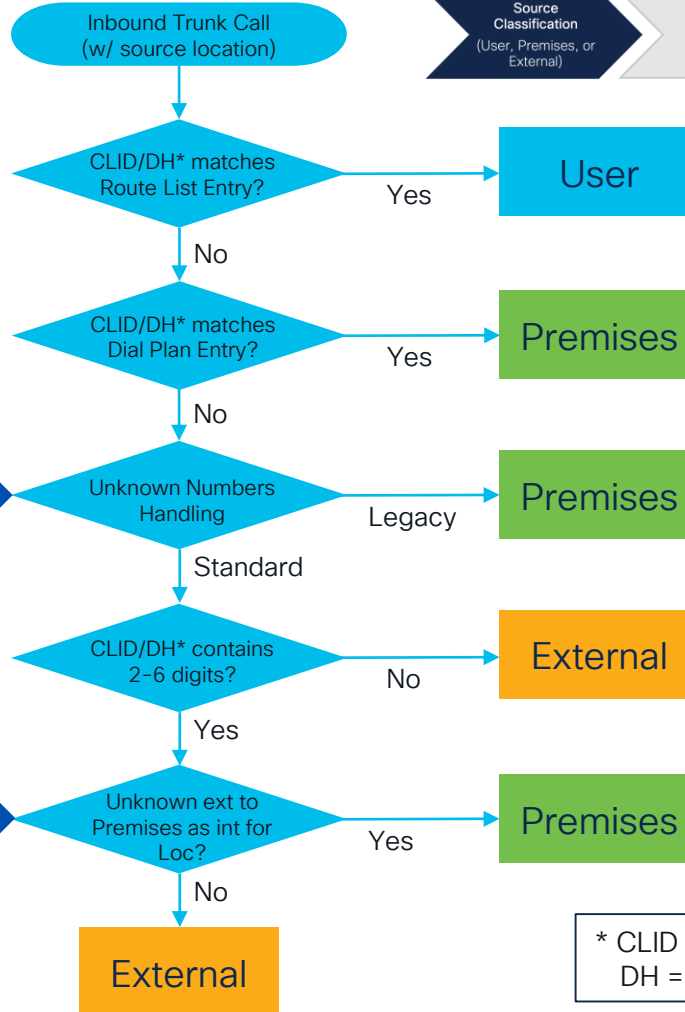
Trunk Location Configuration

Calls to On-Premises Extensions

☒ Route unknown extensions to the premises as internal calls

Route calls to

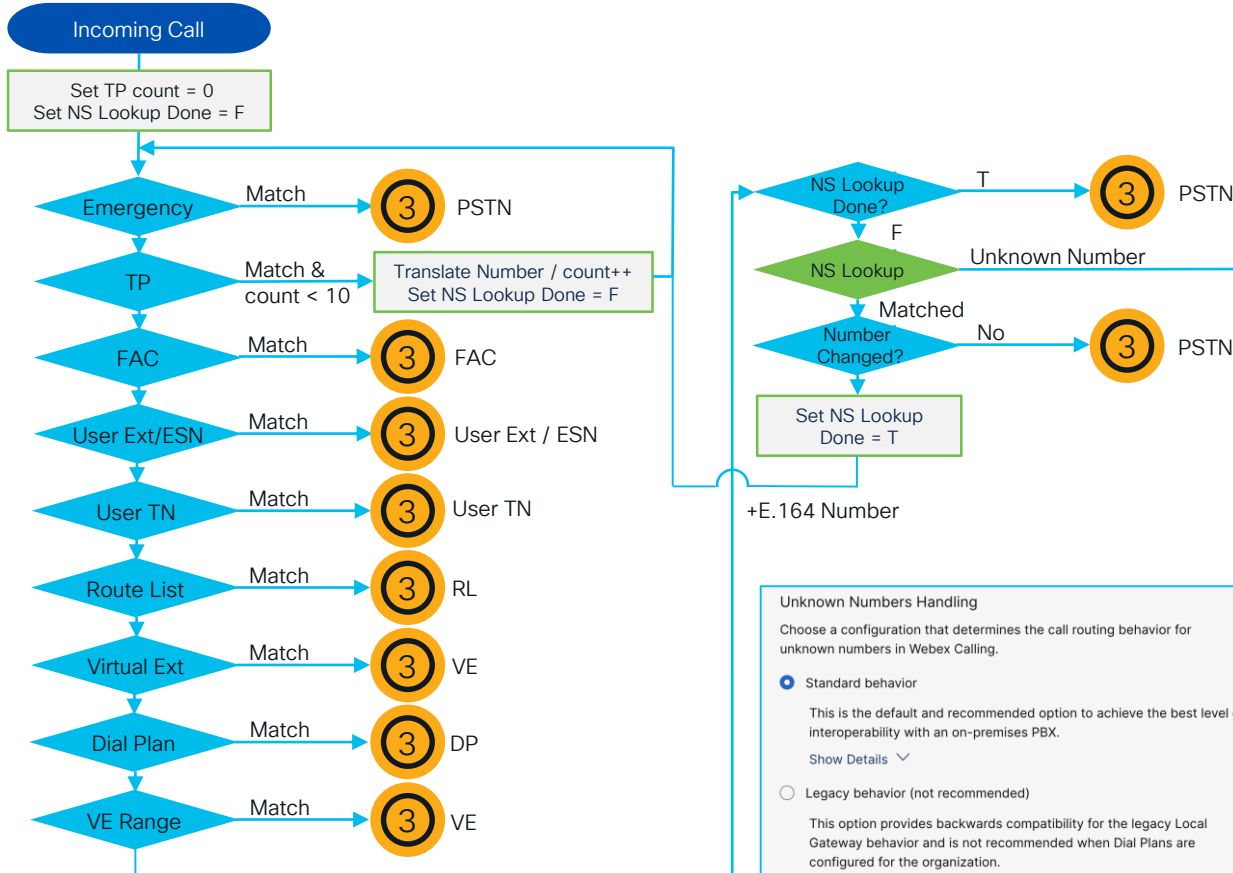
VNT Alpha CUBEs ▾



* CLID = Calling Party ID
DH = SIP Diversion Header

Destination Selection

REFERENCE

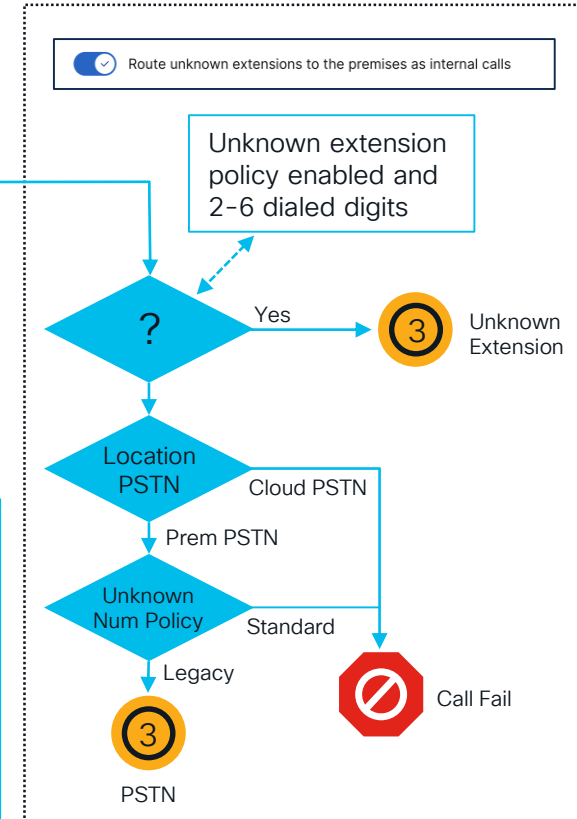


Unknown Numbers Handling

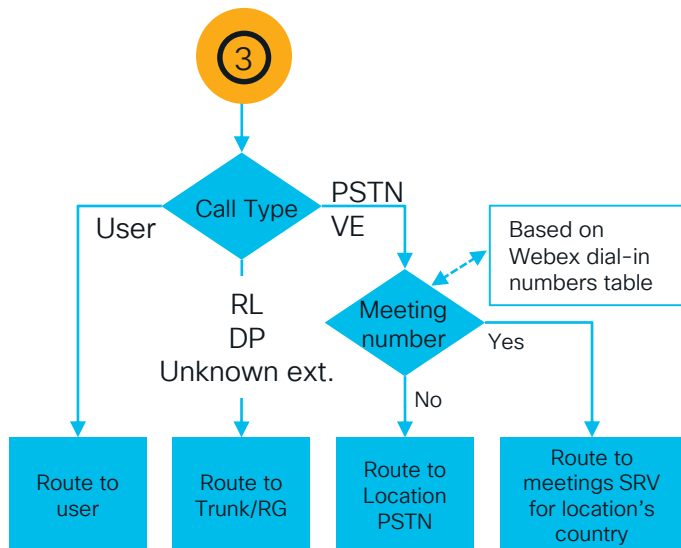
Choose a configuration that determines the call routing behavior for unknown numbers in Webex Calling.

- ☒ **Standard behavior**
This is the default and recommended option to achieve the best level of interoperability with an on-premises PBX.
[Show Details](#)
- ☐ **Legacy behavior (not recommended)**
This option provides backwards compatibility for the legacy Local Gateway behavior and is not recommended when Dial Plans are configured for the organization.
[Show Details](#)

Unknown number handling

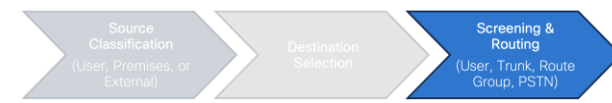


Screening and Routing



Call Routing for Webex Meetings Dial-in calls (Integrated Audio)

- ☒ **Optimized On-net**
This is the default and recommended option to achieve PSTN cost savings and optimized call routing.
- ☐ **PSTN (not recommended)**
This option disables the on-net routing optimization for Webex Meetings dial-in calls.



Screening and Routing

From \ To	User (TN)	User (ESN/Ext)	Trunk (RL)	Trunk (DP or unknown ext)	PSTN / VON
User	✓	✓	✓	✓	✓
Premises	✓	✓	✓	✓	✗
External	✓	✗	✓	✗	✗

Screening and Routing

To From	User (TN)	User (ESN/Ext)	Trunk (RL)	Trunk (DP or unknown ext)	PSTN / VON
User	✓	✓	✓	✓	✓
Premises	✓	✓	✓	✓	✗
External	✓	✗	✓	✗	✗

- Calls from Webex Calling users (including DI users) can be routed anywhere

Screening and Routing

From \ To	User (TN)	User (ESN/Ext)	Trunk (RL)	Trunk (DP or unknown ext)	PSTN / VON
User	✓	✓	✓	✓	✓
Premises	✓	✓	✓	✓	✗
External	✓	✗	✓	✗	✗

- Calls from On-Premises Users can be routed anywhere except for the PSTN

Screening and Routing

From \ To	User (TN)	User (ESN/Ext)	Trunk (RL)	Trunk (DP or unknown ext)	PSTN / VON
User	✓	✓	✓	✓	✓
Premises	✓	✓	✓	✓	✗
External	✓	✗	✓	✗	✗

- Calls from PSTN can only route to User TN's (including DI users). Calls from PSTN cannot call ESN / Extension.

Call Routing Troubleshooting Tool

Calling > Call Routing > Verify Call Routing

- Select Source (User or Trunk and Number)
- Enter Destination
- Tool performs a live route lookup

Verify How Calls Are Routed

Verify your call routing by choosing a cloud user or premises trunk and entering a number or URI that a user would dial. The routing result shows how a call will be translated (assuming that your on-premises configuration is correct).

Select Call Source

☒ Select from Users list ☐ Select from Trunk list

Paul Giralt (+19199940111) ▼

Select Call Destination

8008001180 ✕

See Routing Result

Clear All

The call to +18008001180 routes to an external number.

From

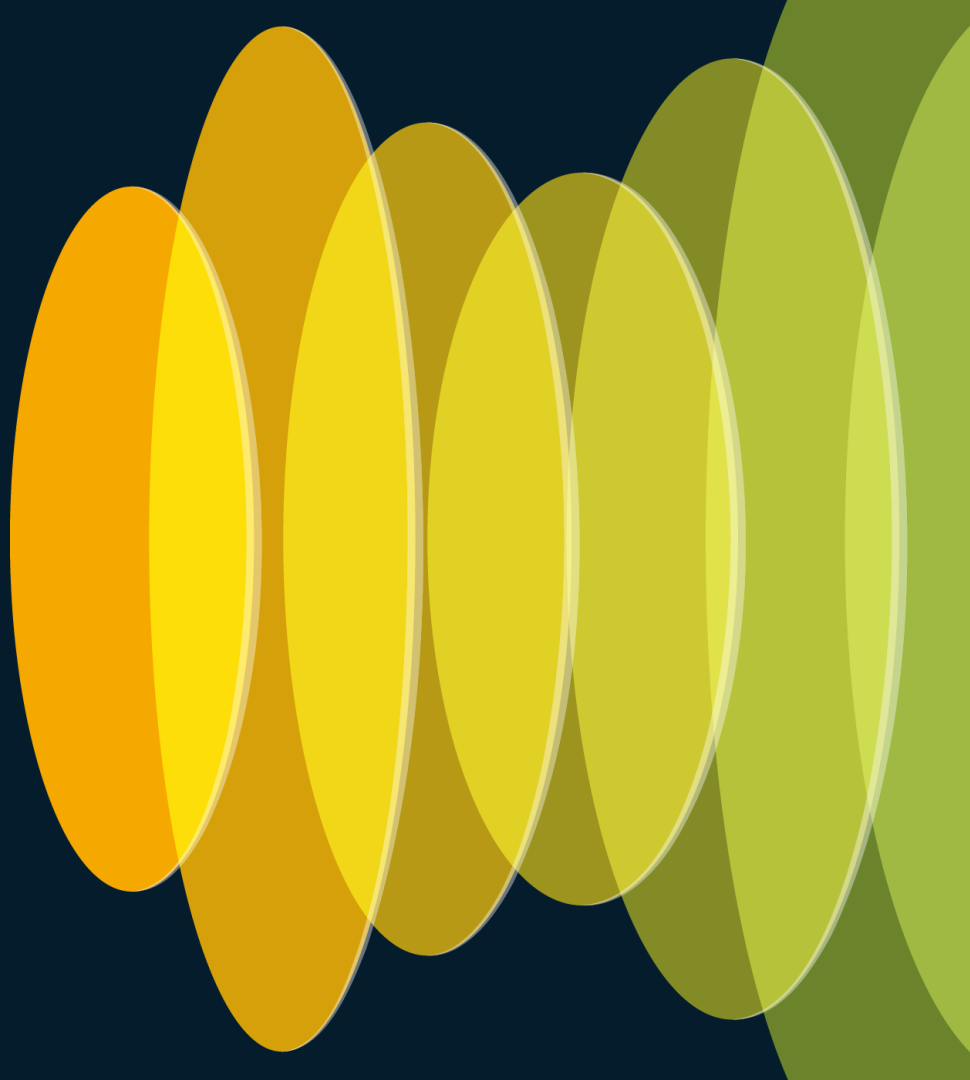
Paul Giralt (+19199940111)
VNT Alpha RTP



To (Initial routing destination)

via Premises-based PSTN
using VNT Alpha RG

SIP Troubleshooting on CUBE



Understanding the Session Initiation Protocol (SIP)

- Watch Chapter 2 from **DGTL-BRKUCC-2932** on Cisco Live On-Demand Library – <https://ciscolive.com/on-demand>

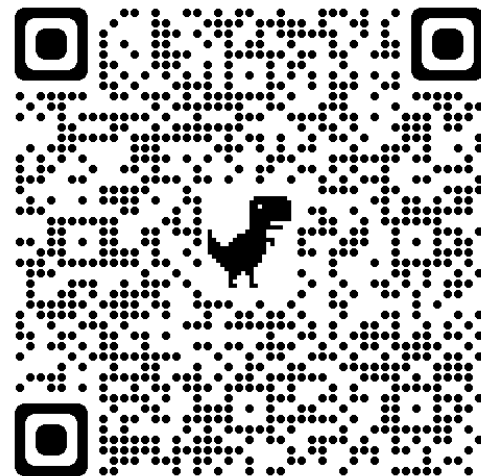
 Q On-Demand Library Featured Sessions Learning Maps Upcoming Events

On-Demand Library

Explore a free collection of on-demand sessions from our global Cisco Live events.

Here are the topics covered in each chapter:

- **Chapter 1 – Introduction:** A brief introduction and overview of the agenda.
- **Chapter 2 – SIP Protocol Overview:** An overview of the SIP protocol. Examination of requests, responses, response codes, media establishment, early offer / delayed offer / early media, and DTMF relay.
- **Chapter 3 – Troubleshooting Tools:** An examination of the various troubleshooting tools available to help diagnose issues with SIP sessions.
- **Chapter 4 – Trace Configuration:** A quick overview of enabling and extracting SIP signaling from Unified CM, Expressway, and CUBE.
- **Chapter 5 – Case Studies – Part 1:** Detailed walk-through of two real-world case studies and examination of the SIP signaling as well as root cause determination.
- **Chapter 6 – Case Studies – Part 2:** Additional case studies with focus on live-demonstration of the troubleshooting tools and how they can be used to troubleshoot a problem.



Make sure you log in after
going to the above site

CUBE VoIP Trace Feature

```
voice service voip  
trace
```

- Logs debugs for individual calls automatically
- VOIP Trace is enabled **by default** from IOS-XE 17.4.1, 17.3.2
- VOIP Trace captures:
 - SIP messages for SIP Trunk to Trunk calls
 - Events and API calls from SIP layer to other layers in CUBE
 - SIP Errors
 - Call Control (unified communication call flows processed by CUBE)
 - FSM (Finite State Machines) states and events
 - Dial peer matched
 - RTP ports allocated
- Will not log REGISTER, OPTIONS, SUBSCRIBE/NOTIFY, INFO

VOIP Trace - Configuration

Memory allocated for VOIP Trace is configurable:

```
CUBE(conf-serv-trace)#memory-limit ?  
<10-1000> Specify maximum memory limit in MB  
platform Use 10 percent of available memory
```

Router#**show processes memory**

Processor	Pool	Total:	8039169484	Used:	403977744	Free:	7635191740
reserve P	Pool	Total:	102404	Used:	88	Free:	102316
lsmpi_io	Pool	Total:	6295128	Used:	6294296	Free:	832

VOIP Trace – Show commands

CUBE#show
all Dis
call-id F
correlator
cover-buffe
session-id
sip-call-id
statistics

CUBE#sh voi
Displaying 1
This may sev
Continue? [y

The screenshot shows a Google search interface with the query "cover buffer". The search results are categorized under "Images for cover buffer". The image results include several blue and white circular pads, a single white pad, a cluster of blue and white pads, and a black cylindrical object. A "View all" button is present below the image results. Below the image results, there is a Walmart advertisement for "Buffer Pad Covers". The advertisement includes the Walmart logo, the URL "https://www.walmart.com > ... > Car Polishers", the product title "Buffer Pad Covers", and a description: "Shop for Buffer Pad Covers at Walmart.com. Save money. ... HEVIRGO Polishing Bonnet Buffer Pad Cover Sponge Polisher for Car Paint Care...". A small image of a yellow and black car polisher is also shown in the advertisement.

VOIP Trace – Cover Buffer – Search-Key

CUBE# show voip trace cover-buffers

----- Cover Buffer -----

Search-key = +19195552653:+19195550050:44669
Timestamp = Mar 17 00:16:28.136
Buffer-Id = 12
CallID = 44669
Peer-CallID = 44670
Correlator = 1
Called-Number = +19195550050
Calling-Number = +19195552653
SIP CallID = BW001626946170324-1056393246@152.188.44.31
SIP Session ID = 4b8cf36c00105000a000ac7e8ab697e8
GUID = 6E12C492AEA1
Tenant = 0
Cause-code = normal call clearing (16)

----- Cover Buffer -----

Search-key = +19195552653:+19195550050:44670
Timestamp = Mar 17 00:16:28.138
Buffer-Id = 13
CallID = 44670
Peer-CallID = 44669
Correlator = 1
Called-Number = +19195550050
Calling-Number = +19195552653
SIP CallID = 6E1360BA-E32A11EE-AEA7B1B7-8E2179A6@64.102.247.82
SIP Session ID = e59da4baa9f45d60979613901ad09af2
GUID = 6E12C492AEA1
Tenant = 0
Cause-code = normal call clearing (16)

- Each call leg is assigned a “search key”
- Search key is a combination of
Calling number, Called number and call-id

Inbound Call Leg Search-key:

+19195552653 : +19195550050 : 44669

Outbound Call Leg Search-key:

+19195552653 : +19195550050 : 44670

VOIP Trace

- To find a call, search for calling or called number

`show voip trace cover-buffer | section <calling or called number>`

- To view debugs for the call

`show voip trace call-id <call-id>`

VOIP Trace – Tip!

alias exec **fc** show voip trace cover-buffer | section
alias exec **sc** show voip trace call-id

- To find a call by calling / called number:

CUBE#**fc 9195552653**

- To show the call details based on call-id:

CUBE#**sc 44669**

CUBE# **fc 9195552653**

----- Cover Buffer -----

Search-key = +19195552653:+19195550050:44669

Timestamp = Mar 17 00:16:28.136

Buffer-Id = 12

CallID = 44669

Peer-CallID = 44670

Correlator = 1

Called-Number = +19195550050

Calling-Number = +19195552653

SIP CallID = BW001626946170324-1056393246@152

SIP Session ID = 4b8cf36c00105000a000ac7e8ab697e8

GUID = 6E12C492AEA1

Tenant = 0

Cause-code = normal call clearing (16)

VOIP Trace – Show VOIP Trace Statistics

VOIP trace statistics displays extensive information about the status, memory consumption, errored or failure calls, successful calls etc..

Router#**show voip trace statistics**

VoIP Trace Statistics

Tracing status : ENABLED at *Sep 12 06:44:02.349

Memory limit configured : 803209216 bytes

Memory consumed : 254550928 bytes (31%)

Total call legs dumped : 2

Oldest trace dumped : *Sep 12 07:29:21.077 Search-key: 9898:30000:64

Latest trace dumped : *Sep 12 07:29:21.010 Search-key: 9898:30000:63

Total call legs captured : 11858

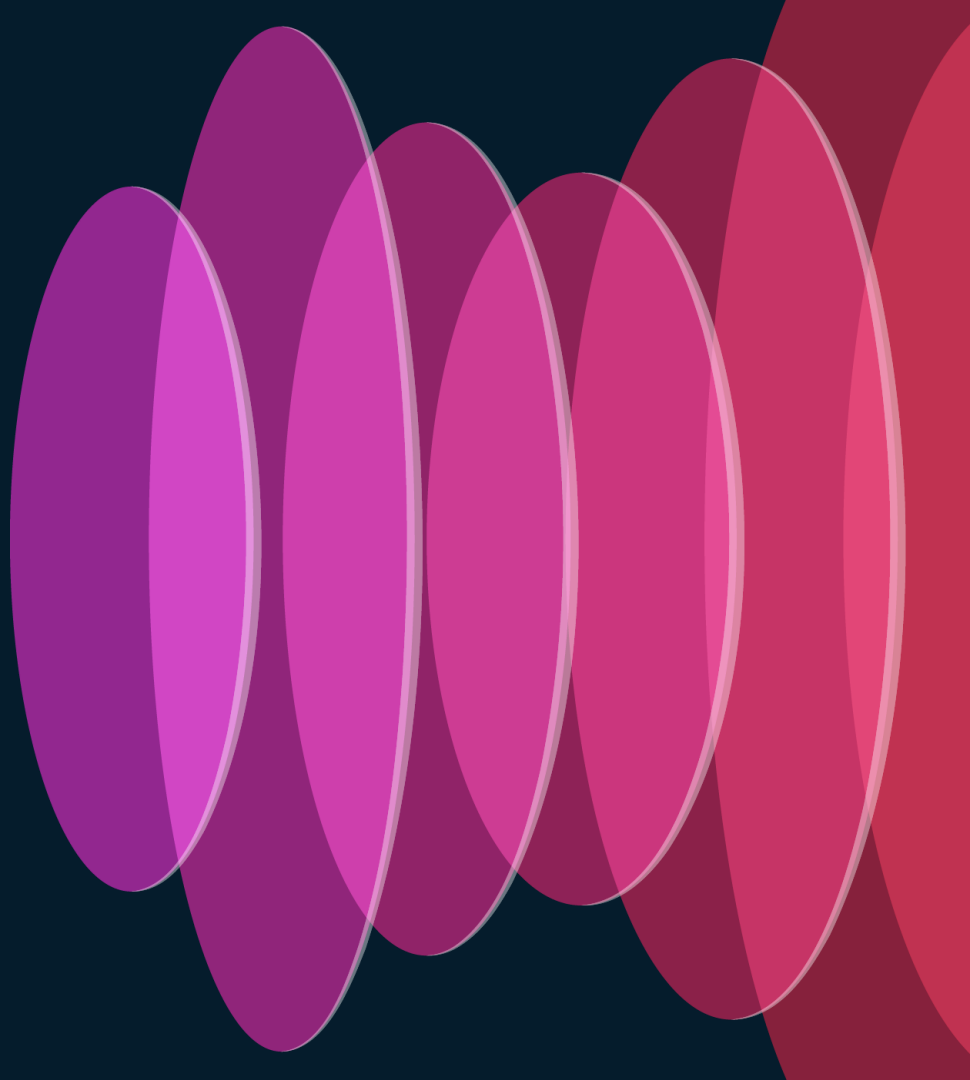
Total call legs available : 11858

Oldest trace available : *Sep 12 06:57:23.923, Search-key: 5250001:4720001:11

Latest trace available : *Sep 13 05:08:25.353, Search-key: 19074502232:30000:13177

Total traces missed : 0

Control Hub Call Troubleshooting



Troubleshooting from Webex Control Hub

☰ webex Control Hub

🔍 Search

🔔 1

?

📄

PG

Overview

Alerts center

MONITORING

Analytics

Troubleshooting

Reports

MANAGEMENT

Users

Groups

Locations

Workspaces

Troubleshooting

🔍 Meetings & Calls

📅 Live Meetings

🕒 Status

👤 Admin Activities

🔗 Connected UC

📄 Logs

📊 Watermark Analysis

🔍 meganb@ecatslab.onmicrosoft.com ×

2 Meetings & 14 Calls

📅 Last 21 Days

05/11/2024 → 05/31/2024

(GMT -04:00) America/New_York ▾

Overall	Personal	Service	Start Time	Meeting / Caller number	Name	Host / Caller	Participant	Duration	Site / Location	Conference / Call ID
Good	● Good	📅	2024-05-30 01:41:38...	23449034658	Cisco Li...	LeeG@...	4	12:58	svs-rtp	2950504955...
Good	● Good	📅	2024-05-24 11:45:59...	23343302306	Megan ...	Megan...	3	05:23	svs-rtp	2838628927...
Good	● Good	📞	2024-05-22 09:56:0...	+19199943708	Megan ...	Megan ...	2	00:06	RTP	SSE0156053...
Good	● Good	📞	2024-05-22 08:17:41...	+19199943708	Megan ...	Megan ...	2	00:14	RTP	SSE0017380...
Good	● Good	📞	2024-05-22 04:33:0...	+19199943708	Megan ...	Megan ...	2	00:29	RTP	SSE2033033...

Troubleshooting from Webex Control Hub

Hop Detail

Megan Bowen
+19199943708
User



Good

Good



Good



+19199943700
+19194766200
Local Gateway

Megan Bowen	Metric	+19199943700
Webex App (Windows)	Endpoint	CUBE
-/44.5.0.29672	Hardware/Version	-/17.12.2
RTP	Location	RTP
-	MAC address	-
192.168.1.97	Local IP	-
136.54.184.120	Public IP	64.102.250.137
Raleigh, NC, US	Geolocation	Morrisville, NC, US
GOOGLE-FIBER	ISP	CISCOSYSTEMS
Wi-Fi	Connection	-
OPUS	Audio Codec	-
MeganB@ecatslab.onmicrosoft.com	Email ID	-
SSE185330059210524521865109@10.2...	Call ID	BW1853302402105241812027062@10...

Call Details

Calling Date: 05/21/2024
Calling Time: 02:53 pm - 02:54 pm (51 seconds)
(GMT -04:00)
America/New_York
Session Type: Webex Call
Participants: 2
Caller Name: Megan Bowen
Caller Number: +19199943708
Audio: VoIP
Video: No
Path Optimization: No Optimization
Calling Type: National
Call Ended by: +19199943700
Dialed Digits: +19194766200

Chart Legend

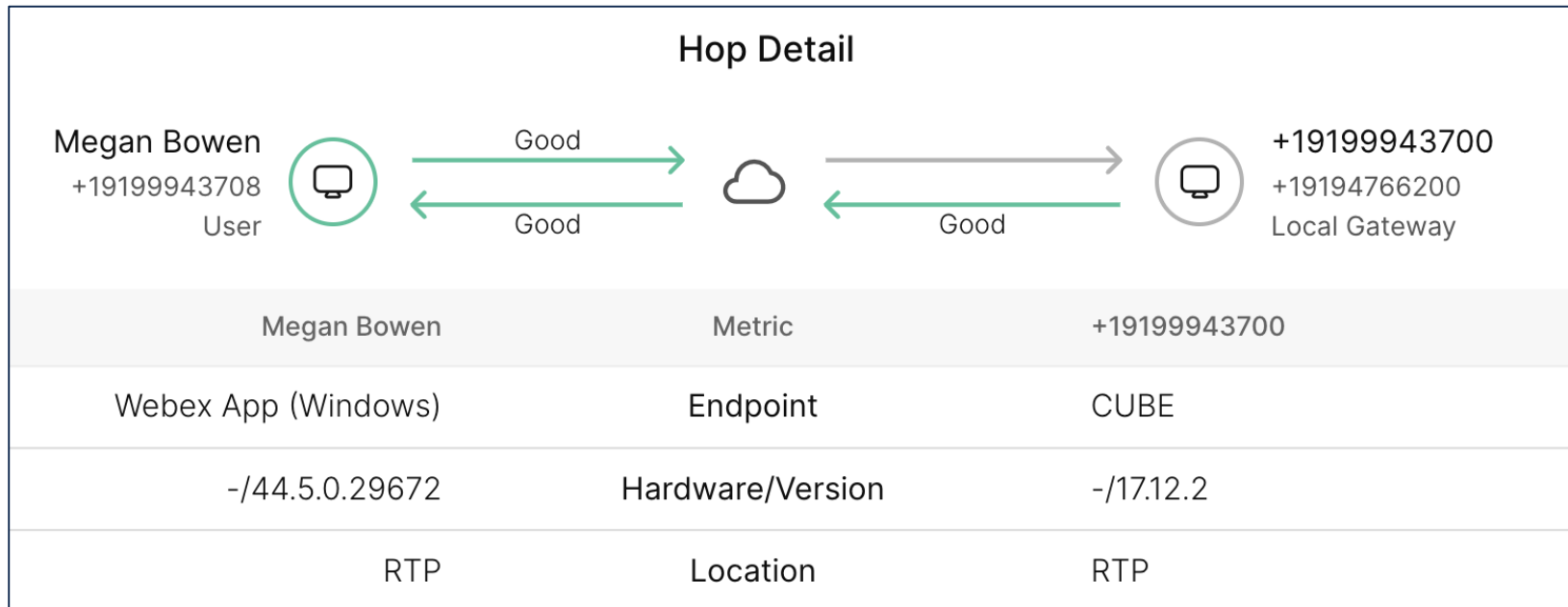
Signal Quality ⓘ

Good

Poor

Not Available

Troubleshooting from Webex Control Hub

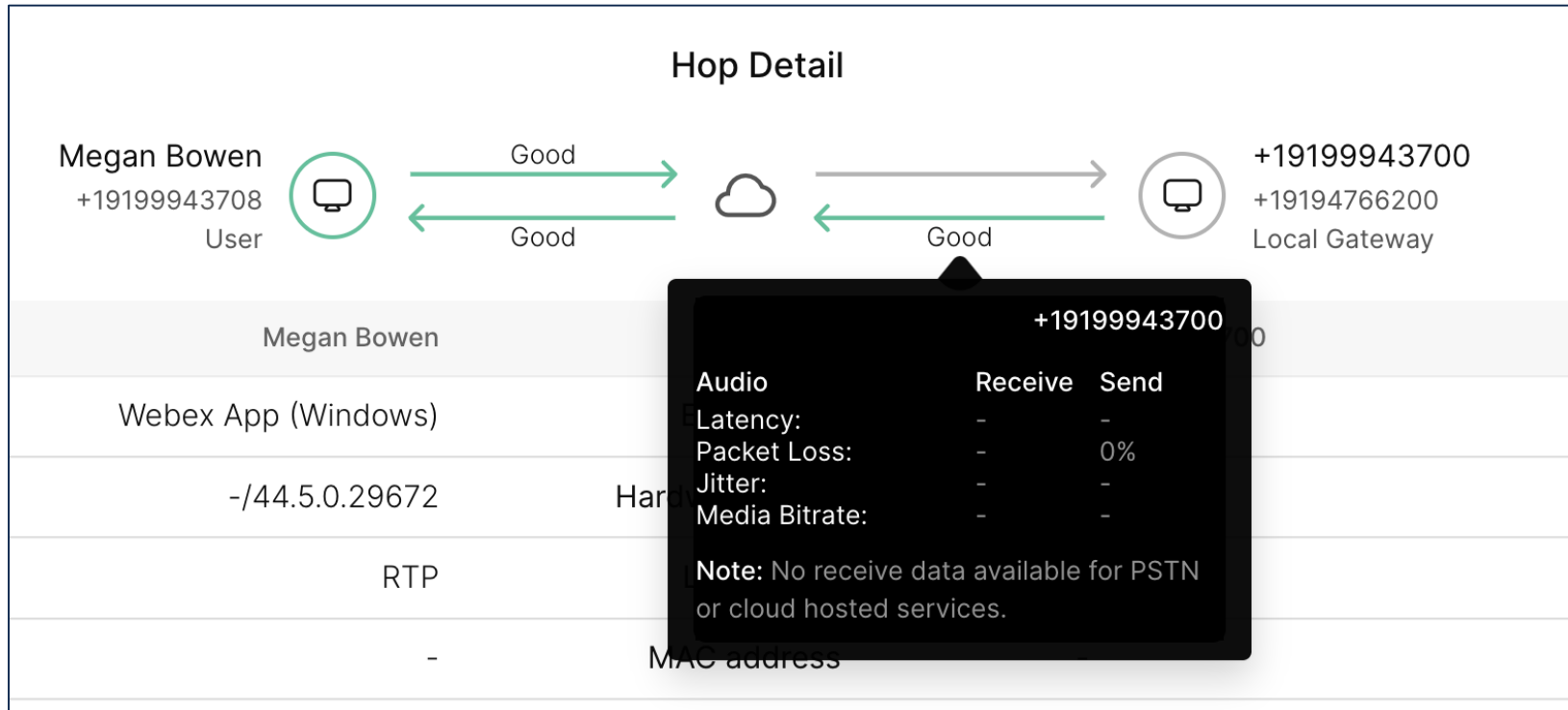


 **1 insight found** [Click here for more details.](#)

ICE

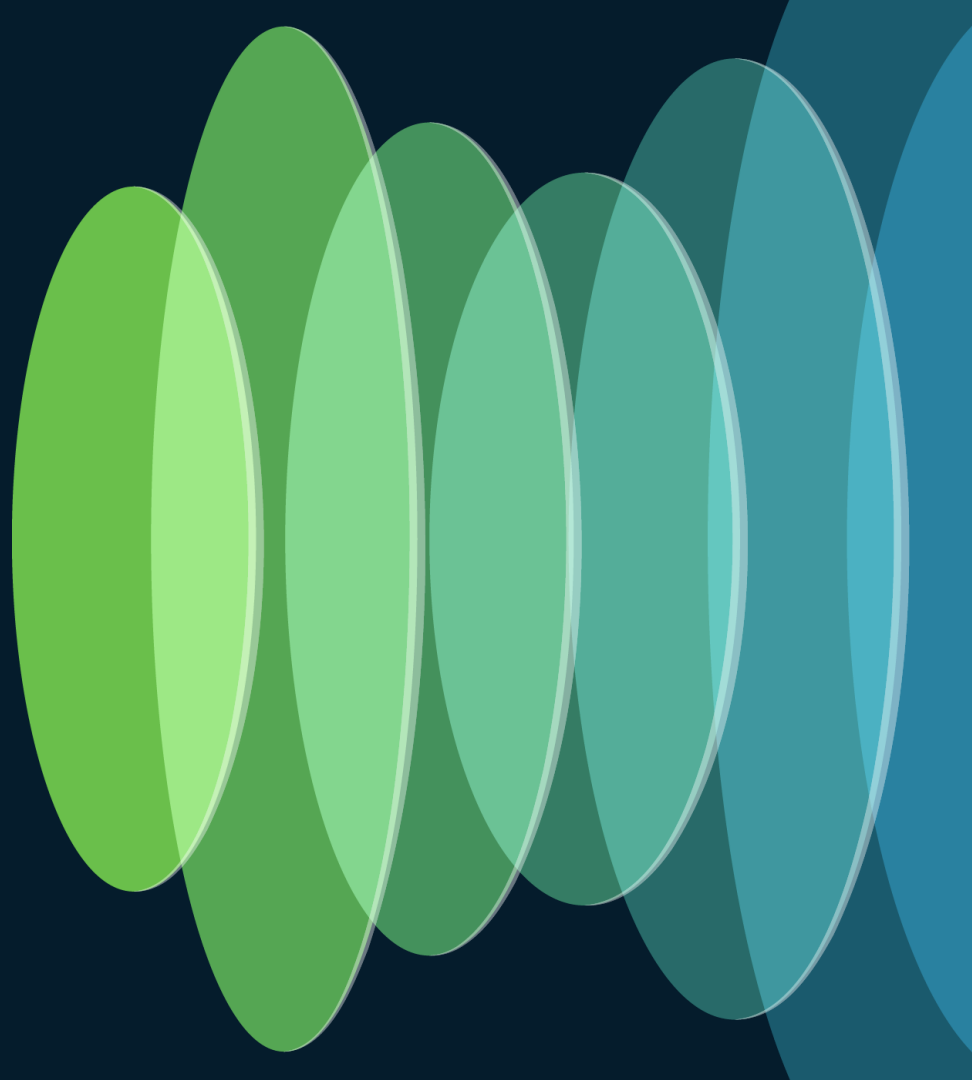
Path Optimization by ICE did not occur as the round trip time on the default path via cloud was the same or better than any optimized path.

Troubleshooting from Webex Control Hub



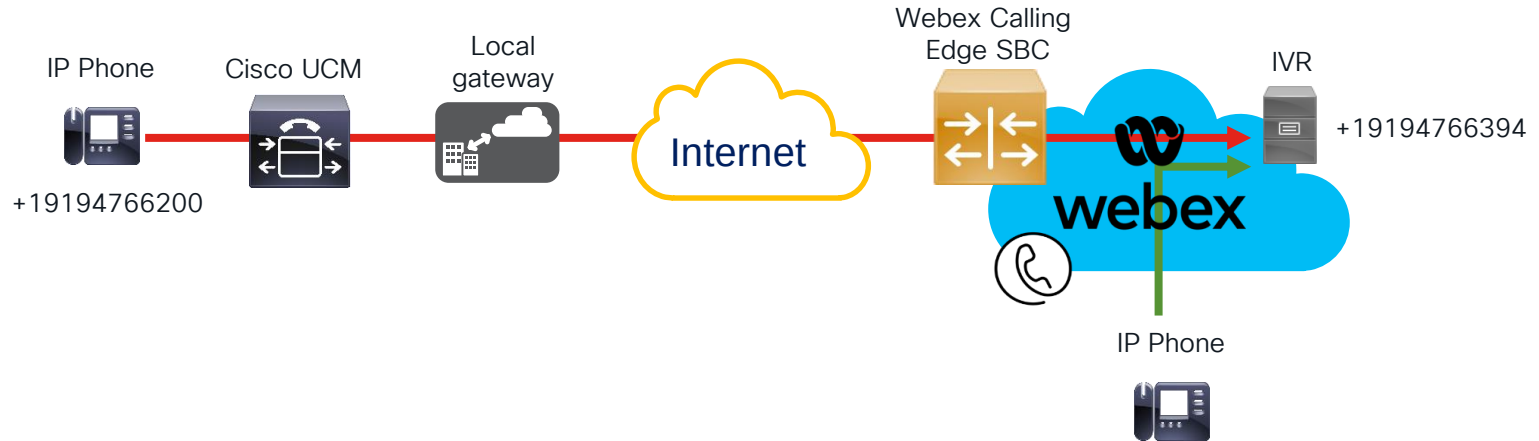
Case Study 1

Calls not ringing on destination



Case Study: Calls not ringing destination

- Scenario: Calling from UCM phone to Webex Calling IVR number
 - User gets ring back continuously - Call is never answered
 - Call from Webex Calling registered phone works



Case Study : Calls not ringing destination

CUBE#**show voip trace cover-buffers | section 9194766394**

Search-key = +19194766200:+19194766394:13542

Timestamp = *Jun 3 03:10:43.063

Buffer-Id = 13

CallID = 13542

Peer-CallID = 13543

Correlator = NA

Called-Number = +19194766394

Calling-Number = +19194766200

SIP CallID = cc4e5980-1ee100ed-33f97f9-3b6a12ac@172.18.106.59

SIP Session ID = d443532f00804a2bb4c1dcb68423024d

GUID = CC4E59800000

Tenant = 300

Search-key = +19194766200:+19194766394:13543

Timestamp = *Jun 3 03:10:43.067

Buffer-Id = 14

CallID = 13543

Peer-CallID = 13542

Correlator = NA

Called-Number = +19194766394

Calling-Number = +19194766200

SIP CallID = 96A29B58-E22111EC-8290C535-8219C882@64.102.250.135

SIP Session ID = 377caecb00105000a000ac7e8ab6043b

GUID = CC4E59800000

Tenant = 200

CUBE#**show voip trace call-id 13542**



Save output to .txt file

Case Study: Calls not ringing destination

Collaboration Solutions Analyzer - <https://cway.cisco.com/csa/>

1

Log Analyzer

Upload logs from your collaboration devices to automatically detect, troubleshoot and resolve issues.

Upload files

2

Include 'show ver' and 'show run' in the file in addition to traces

3

☐	Filename	Product type
☐	cover buffer test.txt	37 KB CUBE

Run analysis

Upload and analyze files

For Contact Center analysis you can also use [CCSM tool](#).

No files found in the user sandbox. Start by uploading them below.

cover buffer test.txt
35.7 KB

1 Selected (Total: 35.7 KB)

Upload

Delete all

Case Study: Calls not ringing destination

Collaboration Solutions Analyzer - <https://cway.cisco.com/csa/>

Log overview

Calls

Search

From DN / URI	To DN / URI	CallId	SIP Call-Id	Peer Call-Id	GUID	Call initiated (UTC)	Call end (UTC)	Log Duration (sec)	Disconnect reason
+19194766200	+19194766394	13542	cc4e5980-1ee100ed-33f97f9-3b6a12ac@172.18.106.59	13543	CC4E59800000	2022-06-03 03:10:43	2022-06-03 03:11:04	21 seconds	16
+19194766200	+19194766394	13543	96A29B58-E22111EC-8290C535-8219C882@64.102.250.135	13542	CC4E59800000	2022-06-03 03:10:43	2022-06-03 03:11:04	21 seconds	16

1-2 of 2

Prev

1

Next

Showing

10

Case Study: Calls not ringing destination

SIP - outgoing

SIPP menuLadder tags☒ Use for signaling and ladder

General information

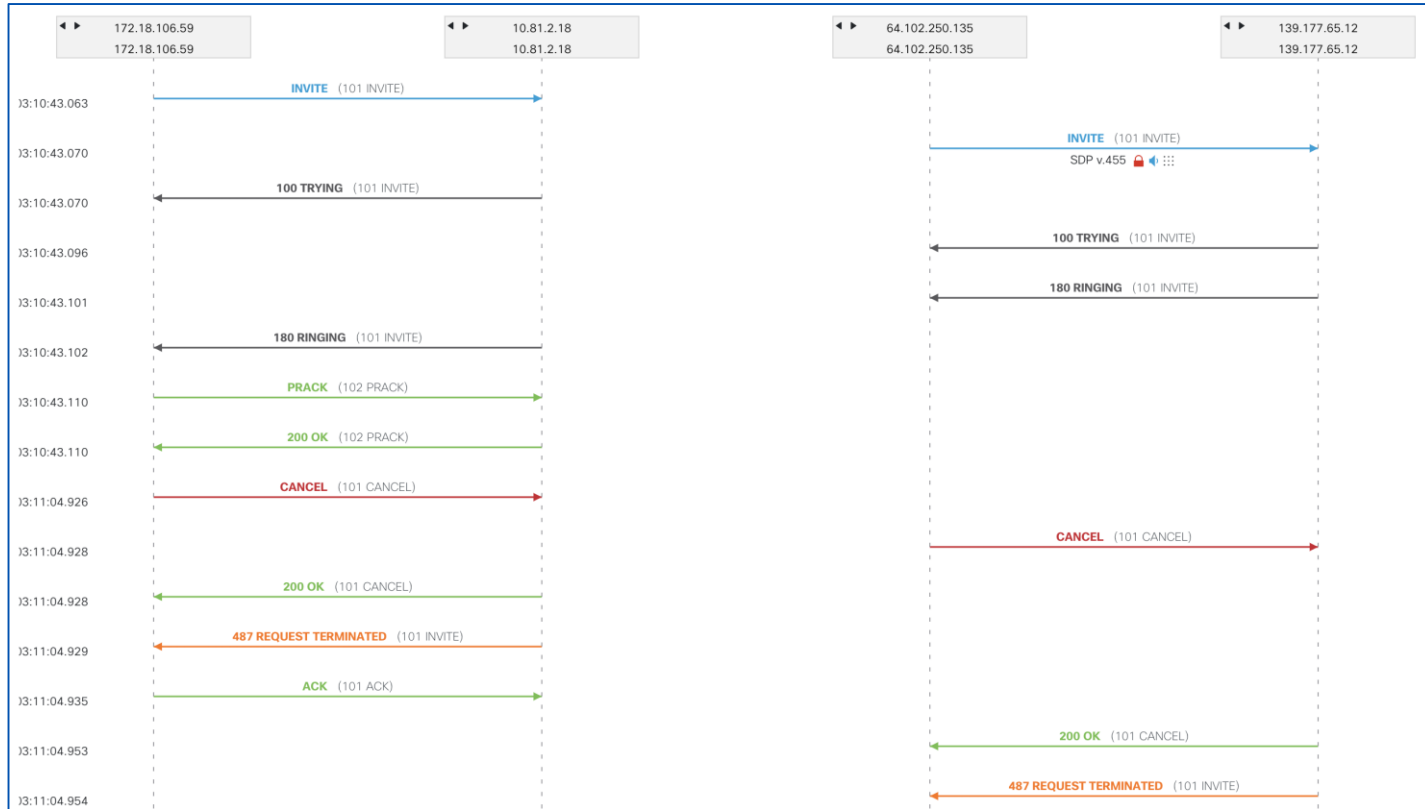
SIP call leg type	Call
From	+19194766200@12013670.us10.bcld.webex.com
To	+19194766394@12013670.us10.bcld.webex.com
Signaling source	64.102.250.135 : 5061
Signaling destination	139.177.65.12 : 8934
Call ID	96A29B58-E22111EC-8290C535-8219C882@64.102.250.135
VRF	Internet
Call leg connects	

Dial-peer information

Dial-peer tag	200201
Dial-peer configuration	description Inbound/Outbound Webex Calling max-conn 250 destination-pattern BAD.BAD session protocol sipv2 session target sip-server destination dpg 300 incoming uri request 200 voice-class codec 99 voice-class stun-usage 200 no voice-class sip localhost voice-class sip tenant 200 dtmf-relay rtp-nte srtp no vad

 No RTP streams linked for this call leg

Case Study: Calls not ringing destination



Case Study: Calls not ringing destination

Use TranslatorX – translatorx.org

- Copy Text debug output from CLI and Paste into TranslatorX or drag-and-drop text file with debugs

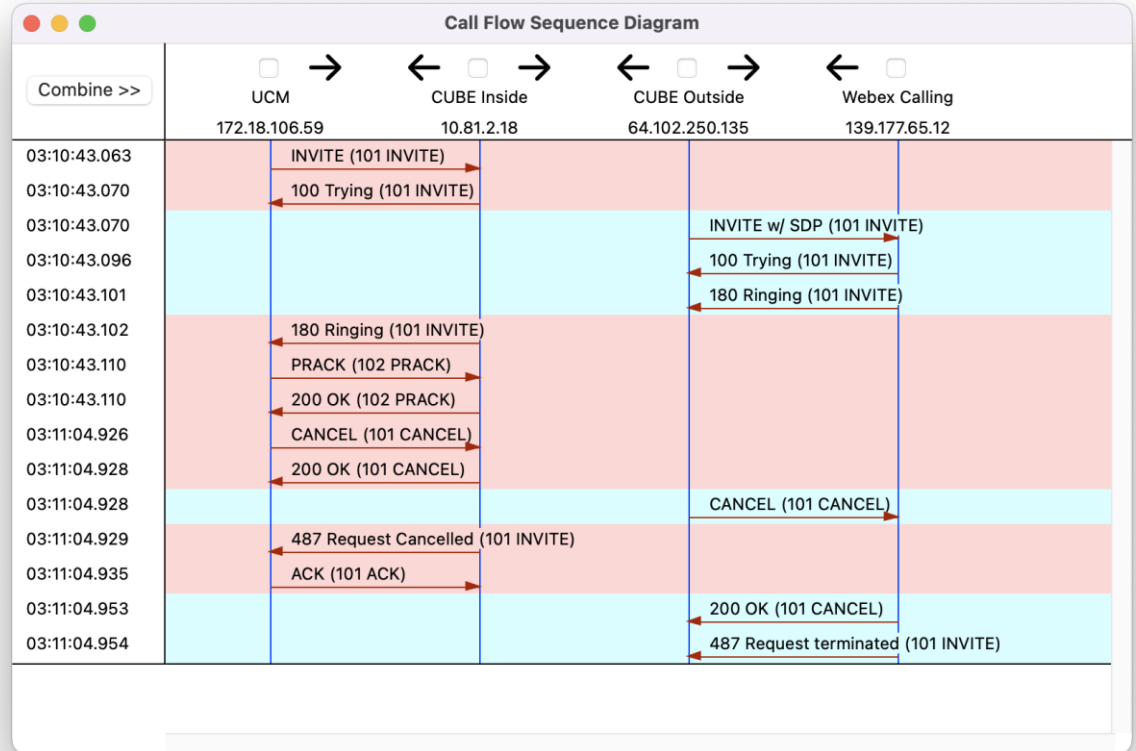
The screenshot shows the Cisco Collaboration Trace Translator application window. At the top, there are buttons for 'Filters Enabled', 'New Filter', 'Filters...', 'Clear Filters', '0 Filters Configured', 'Call List...', 'Search', and 'Clear'. Below these is a table with the following columns: Timestamp, Node/Interface, Remote Device, Direction, Protocol, Message Name, TCP Handle/From Tag, and Call Ref / ID. The table contains 15 rows of SIP message data. At the bottom of the window, there are statistics: 'Lines Processed: 361', 'Msgs Processed: 15', and 'Msgs Displayed: 15'. There are also checkboxes for 'SCCP', 'H.245', 'MGCP', and 'Q.931 / H.225'. On the right, there are checkboxes for 'Exclude SCCP and MGCP Keepalives', 'Exclude SIP REGISTER', 'Exclude SIP SUBSCRIBE / NOTIFY / PUBLISH', 'Exclude SIP OPTIONS', and a 'Generate Diagram' button.

Timestamp	Node/Interface	Remote Device	Direction	Protocol	Message Name	TCP Handle/From Tag	Call Ref / ID
06/03/2022 03:10:43.063	10.81.2.18	172.18.106.59	In	SIP	INVITE	82257127~0d0d25d7~...	cc4e5980-1ee100ed-33...
06/03/2022 03:10:43.070	10.81.2.18	172.18.106.59	Out	SIP	100 Trying	82257127~0d0d25d7~...	cc4e5980-1ee100ed-33...
06/03/2022 03:10:43.070	64.102.250.135	139.177.65.12	Out	SIP	INVITE	33B27F86-22E	96A29B58-E22111EC-8...
06/03/2022 03:10:43.096	64.102.250.135	139.177.65.12	In	SIP	100 Trying	33B27F86-22E	96A29B58-E22111EC-8...
06/03/2022 03:10:43.101	64.102.250.135	139.177.65.12	In	SIP	180 Ringing	33B27F86-22E	96A29B58-E22111EC-8...
06/03/2022 03:10:43.102	10.81.2.18	172.18.106.59	Out	SIP	180 Ringing	82257127~0d0d25d7~...	cc4e5980-1ee100ed-33...
06/03/2022 03:10:43.110	10.81.2.18	172.18.106.59	In	SIP	PRACK	82257127~0d0d25d7~...	cc4e5980-1ee100ed-33...
06/03/2022 03:10:43.110	10.81.2.18	172.18.106.59	Out	SIP	200 OK	82257127~0d0d25d7~...	cc4e5980-1ee100ed-33...
06/03/2022 03:11:04.926	10.81.2.18	172.18.106.59	In	SIP	CANCEL	82257127~0d0d25d7~...	cc4e5980-1ee100ed-33...
06/03/2022 03:11:04.928	10.81.2.18	172.18.106.59	Out	SIP	200 OK	82257127~0d0d25d7~...	cc4e5980-1ee100ed-33...
06/03/2022 03:11:04.928	64.102.250.135	139.177.65.12	Out	SIP	CANCEL	33B27F86-22E	96A29B58-E22111EC-8...
06/03/2022 03:11:04.929	10.81.2.18	172.18.106.59	Out	SIP	487 Request Cancelled	82257127~0d0d25d7~...	cc4e5980-1ee100ed-33...
06/03/2022 03:11:04.935	10.81.2.18	172.18.106.59	In	SIP	ACK	82257127~0d0d25d7~...	cc4e5980-1ee100ed-33...
06/03/2022 03:11:04.953	64.102.250.135	139.177.65.12	In	SIP	200 OK	33B27F86-22E	96A29B58-E22111EC-8...
06/03/2022 03:11:04.954	64.102.250.135	139.177.65.12	In	SIP	487 Request terminated	33B27F86-22E	96A29B58-E22111EC-8...

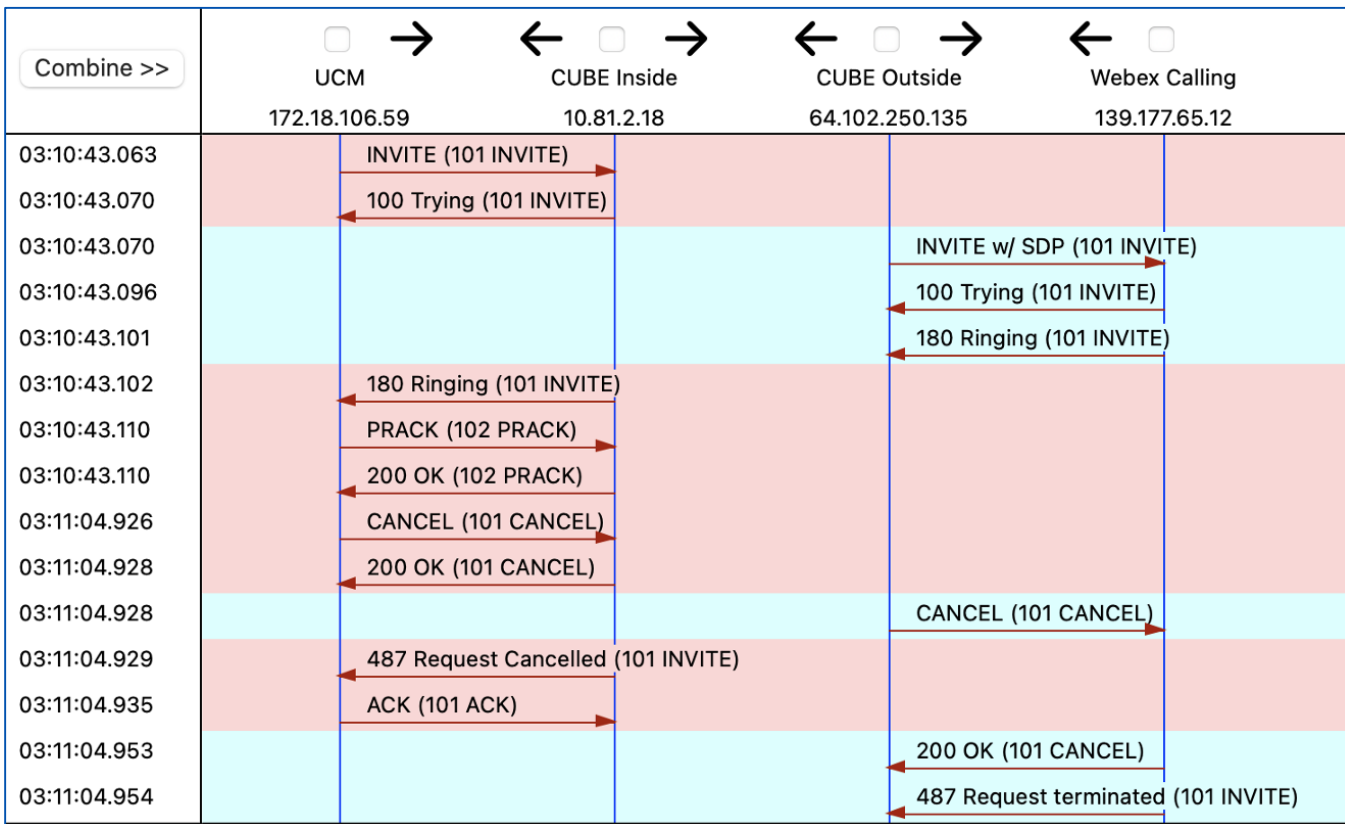
Case Study : Calls not ringing destination

Use TranslatorX – translatorx.org

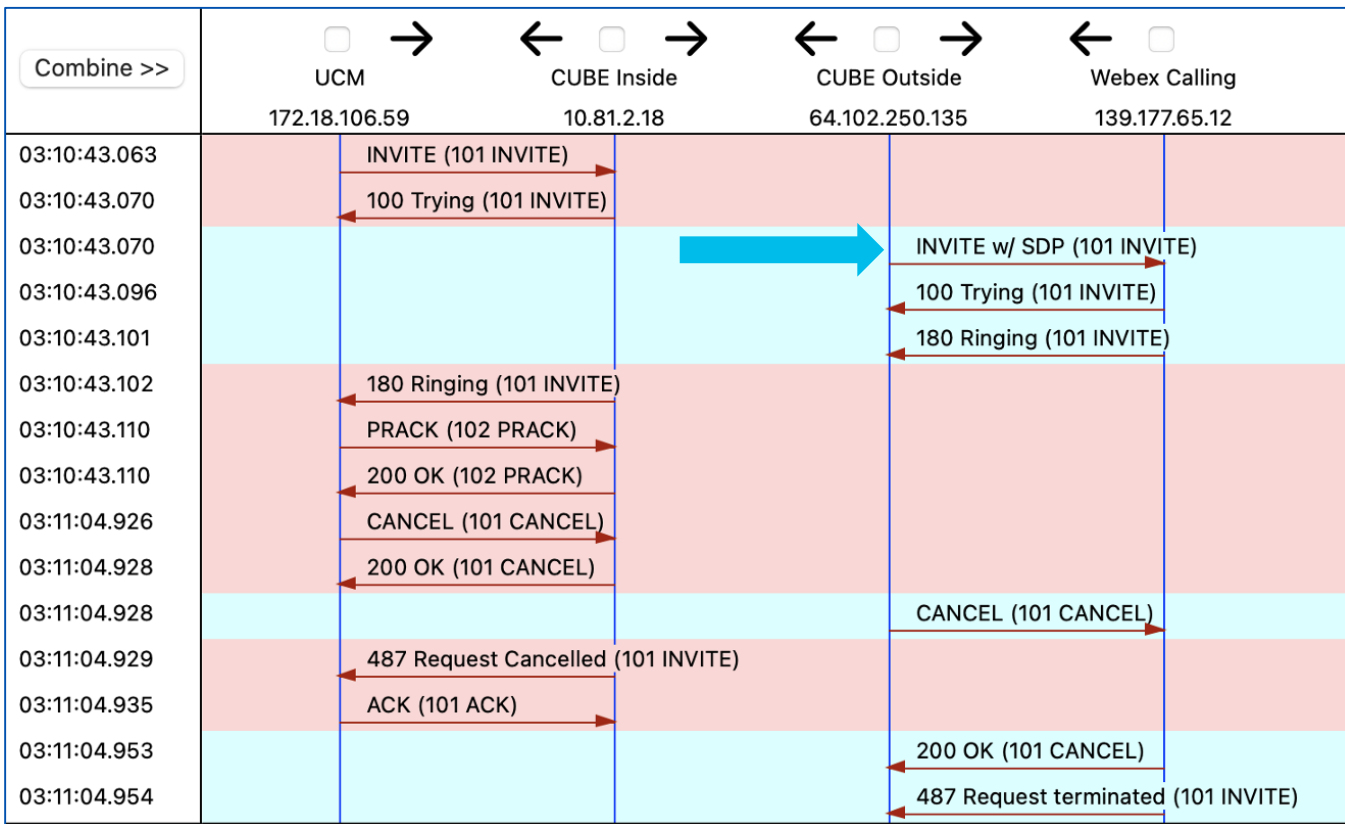
- Click “Generate Diagram” button



Case Study : Calls not ringing destination



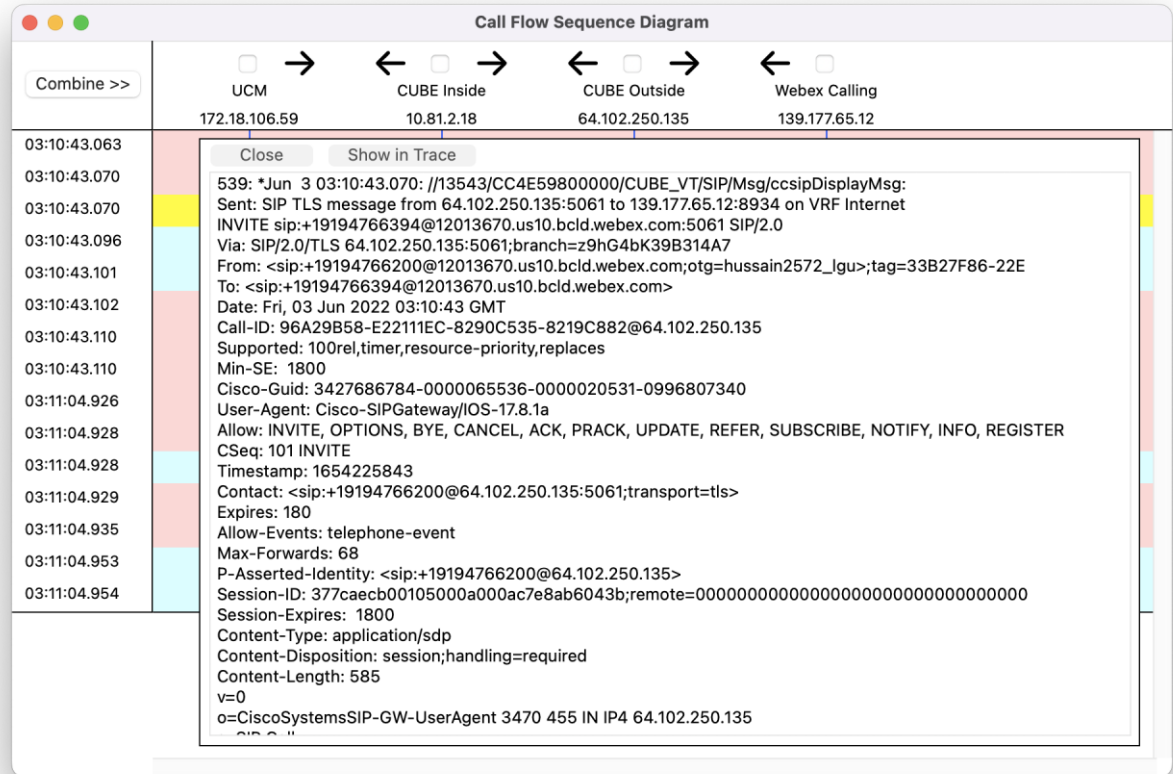
Case Study : Calls not ringing destination



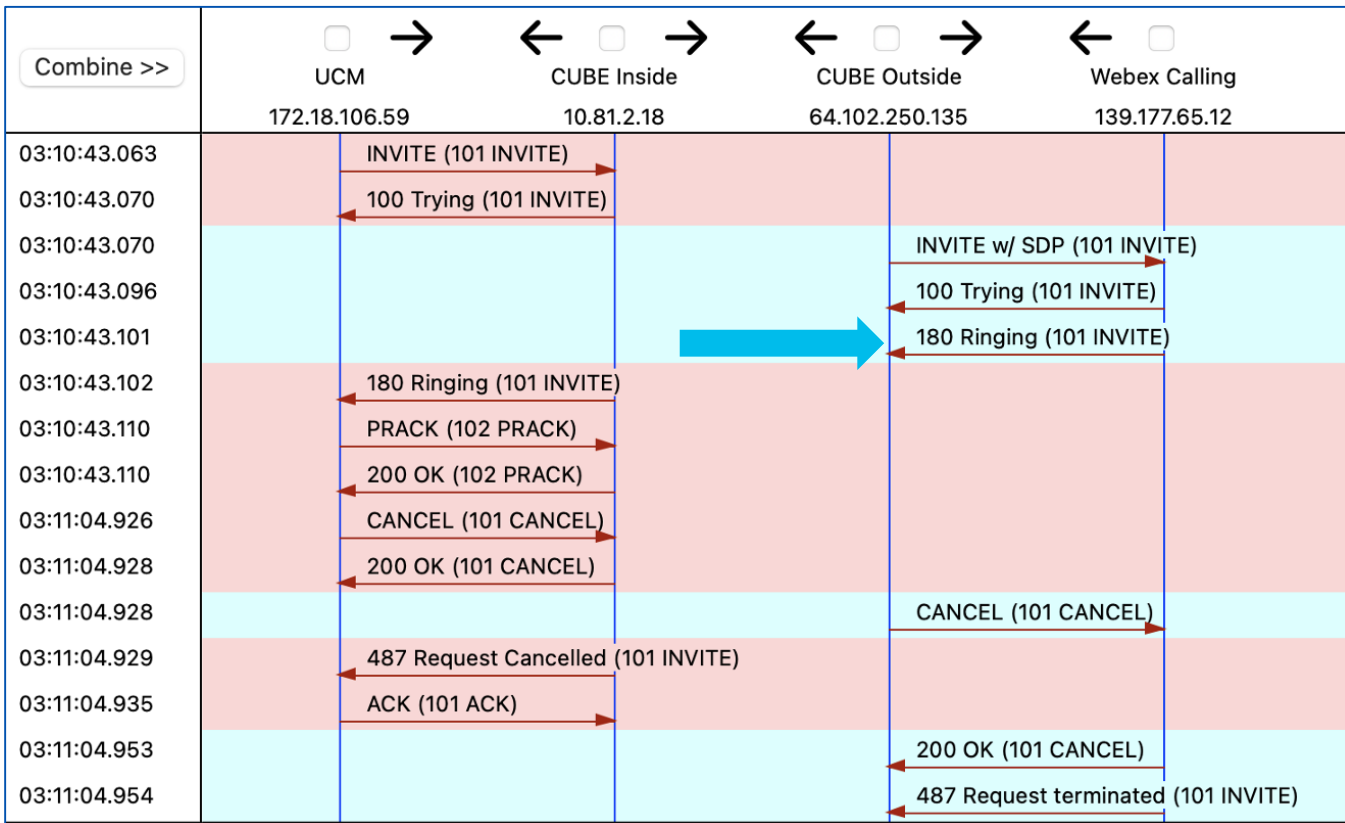
Case Study: Calls not ringing destination

Use TranslatorX – translatorx.org

- Click on outbound INVITE to Webex Calling



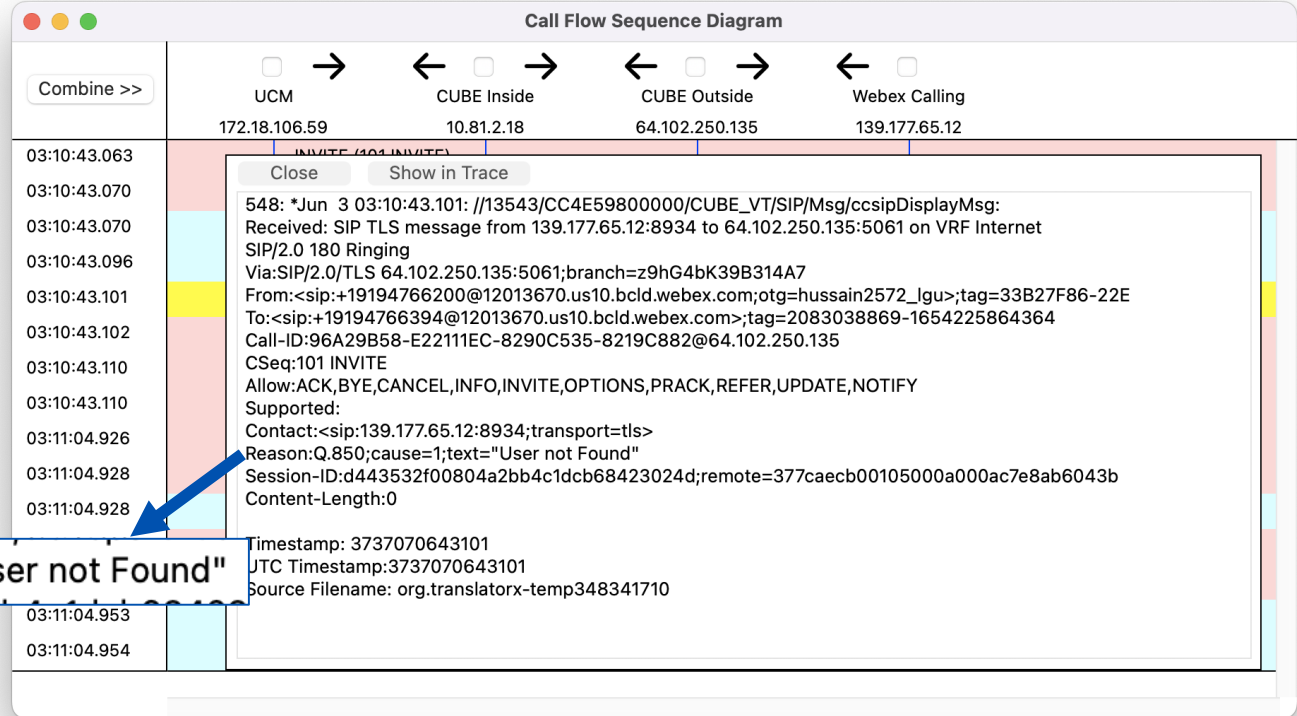
Case Study : Calls not ringing destination



Case Study: Calls not ringing destination

Use TranslatorX – translatorx.org

- Examine 180 Ringing coming from Webex Calling

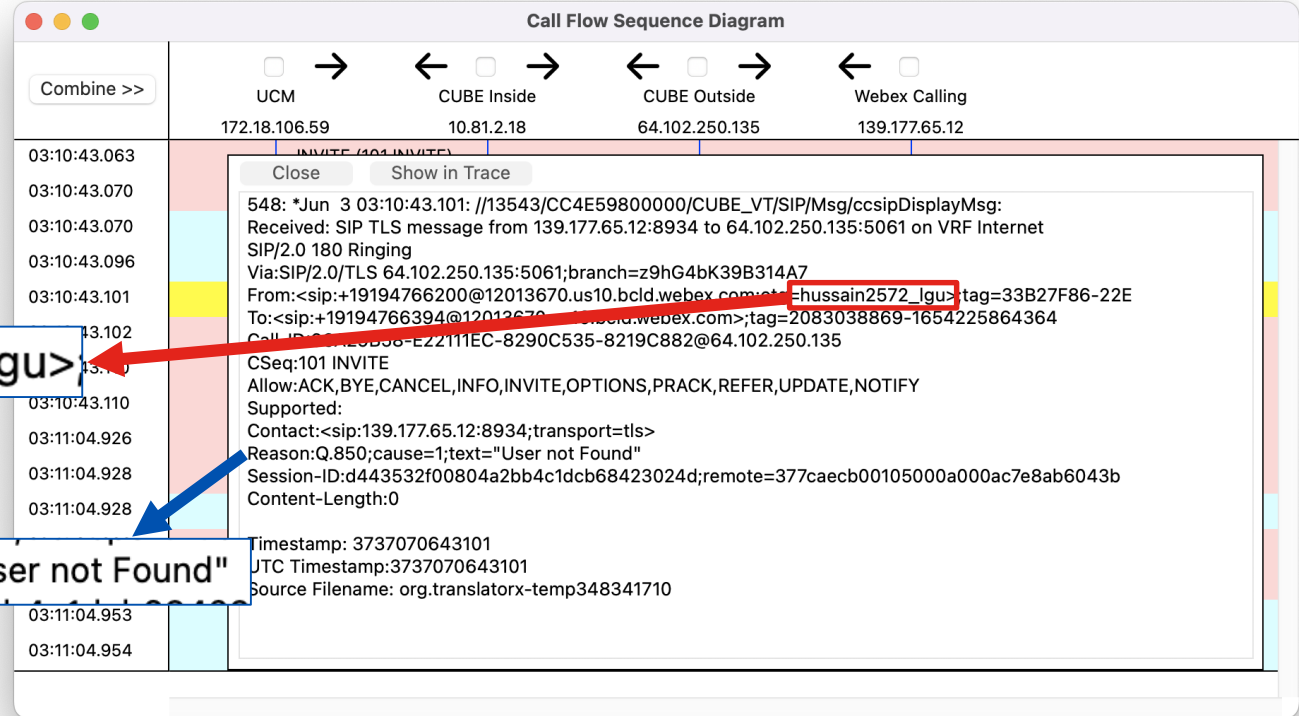


Reason:Q.850;cause=1;text="User not Found"

Case Study: Calls not ringing destination

Use TranslatorX – translatorx.org

- Examine 180 Ringing coming from Webex Calling



Case Study: Calls not ringing destination

voice class sip-profiles 200

rule 9 request ANY sip-header SIP-Req-URI modify "sips:(.*)" "sip:\1"

rule 10 request ANY sip-header To modify "<sips:(.*)" "<sip:\1"

rule 11 request ANY sip-header From modify "<sips:(.*)" "<sip:\1"

rule 12 request ANY sip-header Contact modify "<sips:(.*)>" "<sip:\1;transport=tls>"

rule 13 response ANY sip-header To modify "<sips:(.*)" "<sip:\1"

rule 14 response ANY sip-header From modify "<sips:(.*)" "<sip:\1"

rule 15 response ANY sip-header Contact modify "<sips:(.*)" "<sip:\1"

rule 20 request ANY sip-header From modify ">" ";otg=hussain2572_lgu>"

rule 30 request ANY sip-header P-Asserted-Identity modify "sips:(.*)" "sip:\1"



Case Study: Calls not ringing destination

voice class sip-profiles 200

rule 9 request ANY sip-header SIP-Req-URI modify "sips:(.*)" "sip:\1"

rule 10 request ANY sip-header To modify "<sips:(.*)" "<sip:\1"

rule 11 request ANY sip-header From modify "<sips:(.*)" "<sip:\1"

rule 12 request ANY sip-header Contact modify "<sips:(.*)>" "<sip:\1;transport=tls>"

rule 13 response ANY sip-header To modify "<sips:(.*)" "<sip:\1"

rule 14 response ANY sip-header From modify "<sips:(.*)" "<sip:\1"

rule 15 response ANY sip-header Contact modify "<sips:(.*)" "<sip:\1"

rule 20 request ANY sip-header From modify ">" ";otg=svs-rtp-dmz-cube8a2637_lgu>"

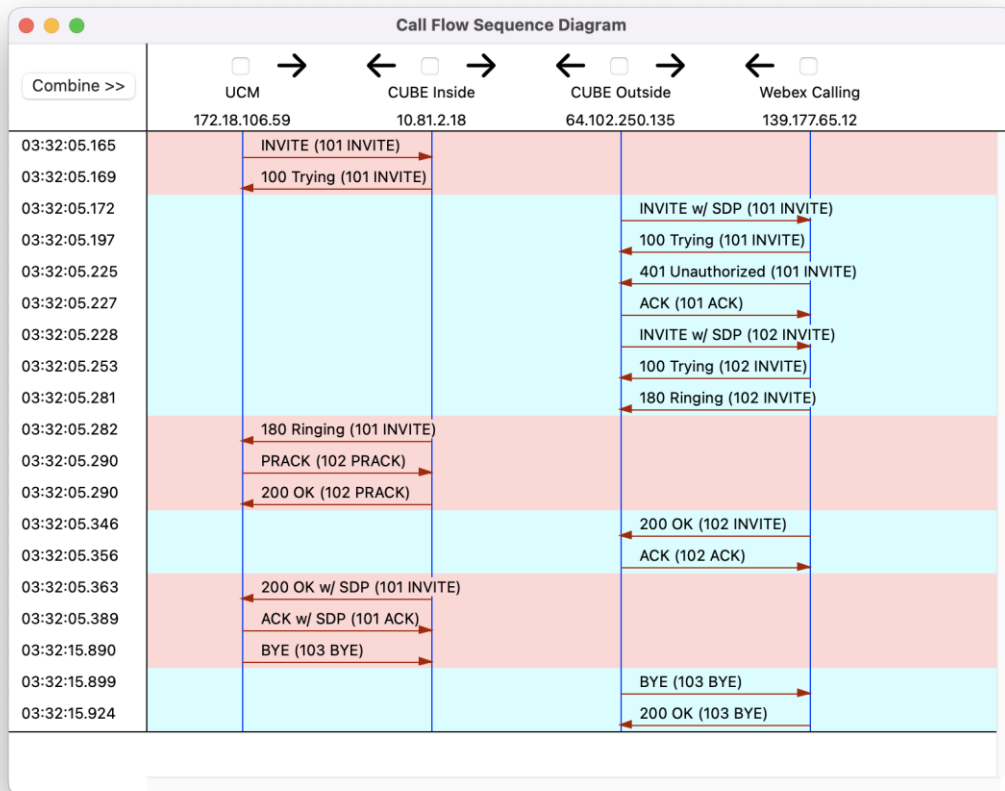
rule 30 request ANY sip-header P-Asserted-Identity modify "sips:(.*)" "sip:\1"



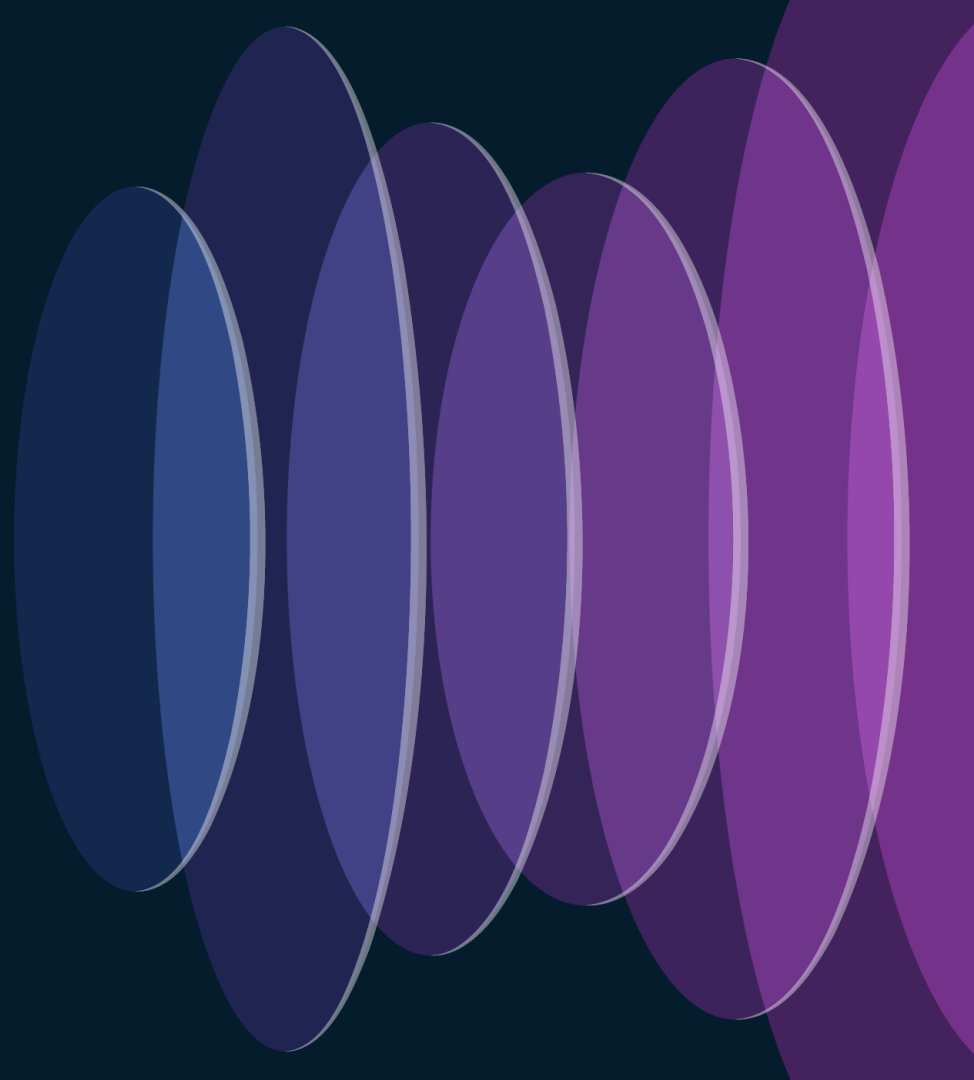
Case Study: Calls not ringing destination

Use TranslatorX – translatorx.org

- After fixing the otg configuration in the SIP profile



Case Study 2: Inbound Call Failures



Complete Your Session Evaluations



Complete a minimum of 4 session surveys and the Overall Event Survey to be entered in a drawing to **win 1 of 5 full conference passes** to Cisco Live 2025.



Earn 100 points per survey completed and compete on the Cisco Live Challenge leaderboard.



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- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand



The bridge to possible

Thank you

CISCO *Live!*

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