



Survivability Enhancements

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Overview

The Survivability for Hosted and Cloud Services on the CUBE is used to:

- Monitor the WAN status periodically from the CUBE.
- Route calls and handle line-side subscriptions locally when the WAN link is down.
- Synchronize the registrations with the server when the WAN link is up.

Advantages of Using CUBE Survivability Feature

The survivability feature on CUBE addresses the following issues by providing local fallback or registration synchronization:

1. When a WAN link or registrar server comes up, it waits until each SIP phone sends the REGISTER message to the server, so that outside phones can reach that phone.
2. If the phone register timer setting is too large, the outside phone waits that much time to reach that phone, after a link flap.
3. If the phone register timer setting is too small, it floods the WAN link.
4. When the WAN link or registrar server is down, you cannot make any local calls.

Local Fallback

- CUBE does not need to configure credentials, as the phones trigger registration. Although CUBE receives REGISTER messages for each phone every 5 minutes; for example, it throttles and sends REGISTER messages every 1 hour to the registrar server, avoiding high WAN bandwidth usage. This addresses the issues 1, 2, and 3.

- In normal operation when the WAN link or registrar server is up, the phone's primary server URL is the registrar server (E2E) registration.
- "OPTIONS ping" is used to monitor the registrar server link status. When the detected link is down, CUBE replies with a 500 message and when the phone receives this message, it sends the REGISTER message to CUBE, which is the secondary server (P2P registration). CUBE replies with a 200 OK message to P2P registration when the link is down. The dial-peer keeps the dynamic registrar session target and the local call does not fail. This addresses issue 4.

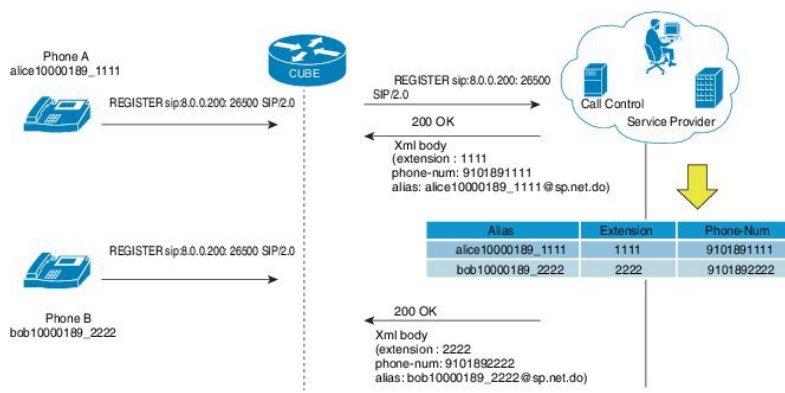
Registration Synchronization

- If you configure the phones to send REGISTER messages every 1 hour (to help alleviate the WAN link), the CUBE uses the credentials that were configured to respond to registrar server authentication challenge. This addresses issue 3.
- When the WAN link or registration server is down (detected by OPTIONS ping), the CUBE keeps the registration database of the SIP phones that were previously registered successfully, and it does not send REGISTER messages out; CUBE replies with a 200 OK message and dial-peer keeps the dynamic registrar session target. The local call does not fail, addressing issue 4.
- When the registrar link is up after a link flap, the CUBE sends REGISTER message for each phone that was earlier successfully registered to the registrar server. This is throttled to avoid bulk REGISTER messages flooding WAN link and the registrar. This addresses issues 1 and 2.

Registration Through Alias Mapping

The following illustration shows how a phone (with alias mapping) registers to the service provider through CUBE.

Figure 1: SIP Phone Registration



The addresses-of-record (AOR) sent in the REGISTER is an alias which is mapped to an extension and (or) phone number by the service provider. The service provider returns the mapping details in the 200 OK response sent to the REGISTER. CUBE has the ability to cache the alias mapping details in its call routing database. When a call is made from the phone, the Request-URI of the INVITE contains the dialed number (short extension or phone number).

If WAN is up, CUBE always routes the INVITE sent from the phone to the service provider without looking up at the alias mapping cache.

If WAN or the service provider is down, that is, in survivability mode, CUBE routes the INVITE locally by looking up at the alias mapping cache.

Alias Mapping—Supported Methods

1. When the service provider returns the mapping details in the 200 OK message of the REGISTER in the following predefined format:

Alias	Extension	Phone
alice10000189_1111	1111	10000189

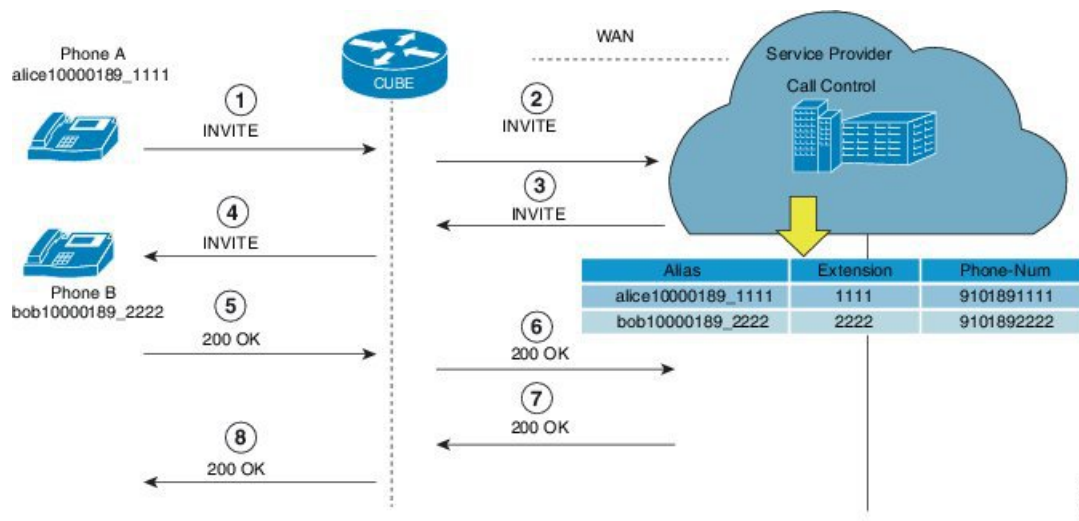
2. The short extension or phone number is embedded in the AOR of the REGISTER. For example, AOR is **alice10000189_1111** and the short extension is **1111**.

An inbound sip profile can be applied to the REGISTER which extracts the extension part from the AOR and adds an X-CISCO-EXTENSION header.

CUBE Survivability When WAN is UP

The following illustration provides an example as to how a typical phone makes a call to another local phone registered in the same server when WAN or the registrar server is up in a typical hosted deployment. The circled numbers in the image indicate the numerical order in which the sequence occurs.

Figure 2: WAN Link is UP - CUBE Deployment



The call flow scenario is as follows: Phone A initiates a call to the Phone B registered to the same server.

1. Phone A sends an initial INVITE request to Phone B to participate in a call session through CUBE.
2. CUBE sends this INVITE to the service provider.
3. The service provider in turn sends the INVITE to CUBE. Since the WAN link is up, the service provider maps details of the user from the register server and provides details of the user, for example, alias of the user, short extension number, and phone number.
4. CUBE sends INVITE with all the above mentioned information to Phone B.

Example: Normal Mode (WAN is Up in P2P Mode)

5. Phone B sends a 200 OK response to CUBE for the received INVITE.
6. CUBE sends a 200 OK answer to the service provider.
7. The service provider responds to CUBE with a 200 OK answer.
8. A final 200 OK response is sent to Phone A by CUBE and the call is established between Phone A and Phone B.

Example: Normal Mode (WAN is Up in P2P Mode)

```
CUBE# show sip-ua registration passthrough status
```

CallId	DirectoryNum	peer	mode	In-Exp	reg-I	Out-Exp	survival
21	NCPPhone1006	1	p2p	135 /144	1	144	normal

Example: Normal Mode (WAN is Up in E2E Mode)

```
CUBE# show sip-ua registration passthrough status
```

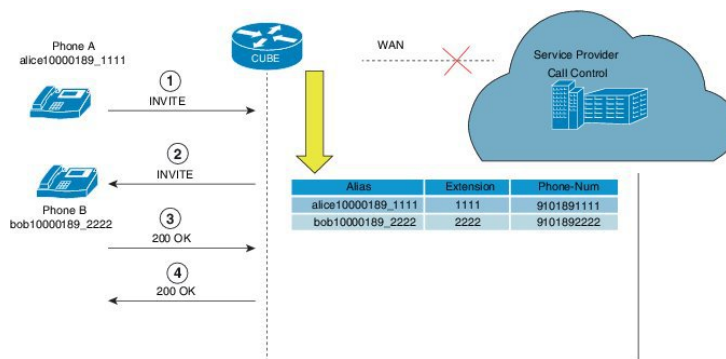
CallId	DirectoryNum	peer	mode	In-Exp	reg-I	Out-Exp	survival
14574	NCPPhone1006	301	e2e	117 /120	--	120	normal

CUBE Survivability When WAN Is Down

In survivability mode, CUBE provides end-to end telephony services when access to the centralized servers is interrupted because of a WAN outage or other factors, like the server being down.

The following illustration shows how a call is established between two endpoints when WAN link is down during survivability by directly dialing into an extension.

Figure 3: CUBE Survivability When WAN Is Down



Earlier, when WAN was down, User A could only contact User B using either the alias or the user-id of User B, and not using their extensions or phone numbers.

Now, in the event the WAN link or registration server is down, when a local call is made, INVITE is sent to CUBE. CUBE maps the details of the user like the extension number and phone-number stored during registration. Local phones can now be reached on their short extensions or phone numbers by similar phones that are subscribed to the server through the same CUBE.

It is possible to register multiple contacts for a single AOR; however, if multiple contacts are registered for a single subscriber, the CUBE uses only the topmost registered contact to deliver the call to that subscriber. For this reason, multiple contacts are not supported.

A few phone models, such as, Cisco IP Phone 7800 Series with Multiplatform Firmware and Cisco IP Phone 8800 Series with Multiplatform Firmware, sends register request to primary registrar only and do not send secondary REGISTER request to the secondary registrar (CUBE) in E2E mode when primary registrar could not be reached. In such scenarios, phone service goes down after it receives 500 response from CUBE for REGISTER request toward primary registrar.

To avoid phones getting into such error condition, CUBE checks for the response from the primary registrar side. When CUBE receives request timeout on WAN side or responses other than 200, 4XX, and 3XX from primary registrar, survivability will be enabled.

To enable survivability on such phones, refer [Configuring Survivability for Phones Sending Single Register Request, on page 9](#).

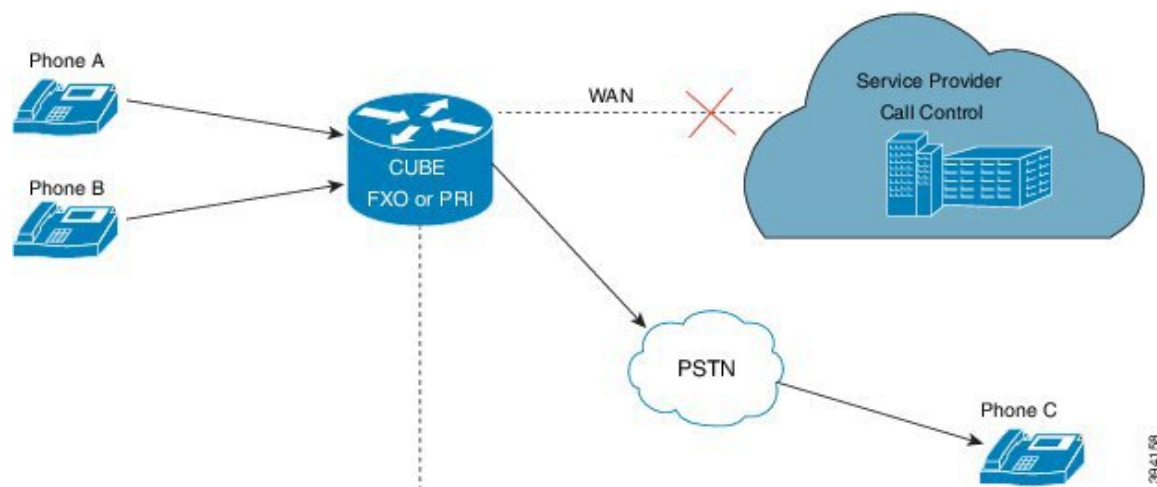
Survivability Support for Public Switched Telephone Network Access When WAN Is Down

If WAN link going down or registrar service unavailable, you can access the phones in the Public Switched Telephone Network (PSTN) through FXO or PRI cards that are configured on Cisco Unified Border Element (CUBE).



Note Survivability support for Public Switched Telephone Network (PSTN) access is supported only for CUBE running on Cisco 4000 Series Integrated Services Router.

Figure 4: Survivability Support for PSTN Access When WAN Is Down



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Example: Survivability Mode in P2P (regsync mode) when WAN is Down

```
CUBE# show sip-ua registration passthrough status
```

CallId	DirectoryNum	peer	mode	In-Exp	reg-I	Out-Exp	survival
38	NCPhone1008	1	p2p	3595 /3600	1	3600	regsync

Example: Survivability Mode in E2E (local fallback mode) when WAN is Down

```
CUBE# show sip-ua registration passthrough status
```

```
CallId    DirectoryNum    peer    mode    In-Exp    reg-I    Out-Exp    survival
=====    =====
70        NCPPhone1006    1       e2e     35 /70    --       0         locfall
=====
```

```
CallId    DirectoryNum    peer    mode    In-Exp    reg-I    Out-Exp    survival
=====    =====
513       NCPPhone1008    1       e2e     40 /70    --       0         locfall
=====
```

Feature Information for Survivability for Hosted and Cloud Services

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for Survivability for Hosted and Cloud Services

Feature Name	Releases	Feature Information
Survivability for Hosted and Cloud Services	Cisco IOS XE Fuji 16.9.1	Supports survivability for Hosted and Cloud Services .

Configure Survivability for Hosted and Cloud Services**Configure Local Fallback or Registration Synchronization Globally****SUMMARY STEPS**

1. enable
2. configure terminal
3. voice service voip
4. sip
5. registration passthrough local-fallback tag
6. end

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example:	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
	Device> enable	
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	voice service voip Example: Device(config)# voice service voip	Enters voice service VoIP configuration mode.
Step 4	sip Example: Device(conf-voi-serv)# sip	Enters voice service SIP configuration mode.
Step 5	registration passthrough local-fallback tag Example: Device(conf-serv-sip)# registration passthrough local-fallback 10	Configures SIP registration passthrough for local fallback mode; this will locally respond to REGISTER in p2p mode when WAN is down. The <i>tag</i> is the WAN link or registrar server dial-peer tag. <ul style="list-style-type: none"> To configure the registration sync mode, you can use the registration passthrough reg-sync tag command. Use the static keyword to set the phone URL to p2p registration.
Step 6	end Example: Device(conf-serv-sip)# end	Returns to privileged EXEC mode.

Configure Local Fallback or Registration Synchronization at the Tenant Level

SUMMARY STEPS

1. enable
2. configure terminal
3. voice class tenant *tag*
4. registration passthrough local-fallback *tag*
5. exit
6. dial-peer voice *tag* voip
7. voice-class sip tenant *tag*
8. exit

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: <pre>Device> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: <pre>Device# configure terminal</pre>	Enters global configuration mode.
Step 3	voice class tenant <i>tag</i> Example: <pre>Device(config)# voice class tenant 1</pre>	Enters voice class tenant configuration mode.
Step 4	registration passthrough local-fallback <i>tag</i> Example: <pre>Device(config-class)# registration passthrough local-fallback 10</pre>	Configures SIP registration passthrough for local fallback mode; this locally responds to REGISTER in p2p mode when WAN is down. The <i>tag</i> is the WAN link or registrar server dial-peer tag. <ul style="list-style-type: none"> • To configure the registration sync mode, you can use the registration passthrough reg-sync <i>tag</i> command. Use the static keyword to set the phone URL to p2p registration.
Step 5	exit Example: <pre>Device(config-class)# exit</pre>	Exits tenant configuration mode and returns to global configuration mode.
Step 6	dial-peer voice <i>tag</i> voip Example: <pre>Device(config)# dial-peer voice 444 voip</pre>	Enters dial peer voice configuration mode.
Step 7	voice-class sip tenant <i>tag</i> Example: <pre>Device(config-dial-peer)# voice-class sip tenant 1</pre>	Associates the dial-peer with the tenant.
Step 8	exit Example: <pre>Device(config-class)# exit</pre>	Exits dial-peer configuration mode and returns to global configuration mode.

Configure Local Fallback or Registration Synchronization on a Dial Peer

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **dial-peer voice *tag* voip**
4. **voice-class sip registration passthrough local-fallback *tag***
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: <pre>Device> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: <pre>Device# configure terminal</pre>	Enters global configuration mode.
Step 3	dial-peer voice <i>tag</i> voip Example: <pre>Device(config)# dial-peer voice 4 voip</pre>	Enters dial peer VoIP configuration mode.
Step 4	voice-class sip registration passthrough local-fallback <i>tag</i> Example: <pre>Device(config-dial-peer)# voice-class sip registration passthrough local-fallback 10</pre>	Configures SIP registration passthrough for local fallback mode; this will locally respond to REGISTER in p2p mode when WAN is down. The <i>tag</i> is the WAN link or registrar server dial-peer tag. <ul style="list-style-type: none"> • To configure the registration sync mode, you can use the voice-class sip registration passthrough reg-sync <i>tag</i> command.
Step 5	end Example: <pre>Device(conf-serv-sip)# end</pre>	Returns to privileged EXEC mode.

Configuring Survivability for Phones Sending Single Register Request

The following configuration enables Cisco Unified Border Element (CUBE) to always check for the response from remote side. Request timeout on WAN side or response other than 200, 4XX, and 3XX received by CUBE from SBC enables the survivability.

SUMMARY STEPS

1. enable
2. configure terminal
3. voice service voip
4. sip
5. survivability single-register
6. end

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: <pre>Device> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: <pre>Device# configure terminal</pre>	Enters global configuration mode.
Step 3	voice service voip Example: <pre>Device(config)# voice service voip</pre>	Enters voice service VoIP configuration mode.
Step 4	sip Example: <pre>Device(conf-voi-serv)# sip</pre>	Enters voice service SIP configuration mode.
Step 5	survivability single-register Example: <pre>Device(conf-serv-sip)# survivability single-register</pre>	Enables CUBE to always check for the response from the remote side. Request timeout on WAN side or response other than 200, 4XX, and 3XX received by CUBE from SBC enables the survivability.
Step 6	end Example: <pre>Device(conf-serv-sip)# end</pre>	Returns to privileged EXEC mode.

Configure OPTIONS Ping

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **dial-peer voice *tag* voip**
4. **voice-class sip options-keepalive up-interval *value* down-interval *value***
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: <pre>Device> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: <pre>Device# configure terminal</pre>	Enters global configuration mode.
Step 3	dial-peer voice <i>tag</i> voip Example: <pre>Device(config)# dial-peer voice 3 voip</pre>	Enters dial peer configuration mode.
Step 4	voice-class sip options-keepalive up-interval <i>value</i> down-interval <i>value</i> Example: <pre>Device(config-dial-peer)# voice-class sip options-keepalive up-interval 120 down-interval 120</pre>	Configures OPTIONS keepalive timer interval for DOWN and UP endpoints.
Step 5	end Example: <pre>Device(config-dial-peer)# end</pre>	Returns to privileged EXEC mode.

Configure Registration Timer

Perform the following task to configure the registration timer in the CUBE rather than on all SIP phones.

SUMMARY STEPS

1. enable
2. configure terminal
3. voice service voip
4. sip
5. registrar server expires max *value* min *value*
6. end

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: <pre>Device> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: <pre>Device# configure terminal</pre>	Enters global configuration mode.
Step 3	voice service voip Example: <pre>Device(config)# voice service voip</pre>	Enters voice service VoIP configuration mode.
Step 4	sip Example: <pre>Device(conf-voi-serv)# sip</pre>	Enters voice service SIP configuration mode.
Step 5	registrar server expires max <i>value</i> min <i>value</i> Example: <pre>Device(conf-serv-sip)# registrar server expires max 300 min 200</pre>	Configures the maximum and minimum time (in seconds) for the registration expiry in CUBE. <ul style="list-style-type: none"> • If the phone sends expiry time as 600 seconds, then the CUBE will reply with 200 OK message and expiry time 300 seconds, and the phone will resend with expiry 300.
Step 6	end Example: <pre>Device(conf-serv-sip)# end</pre>	Returns to privileged EXEC mode.

Configuring the REGISTER Message Throttling in CUBE

Perform the following task to throttle the REGISTER message in CUBE.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **voice service voip**
4. **sip**
5. **registration passthrough rate-limit expires *value* local-fallback *tag***
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: <pre>Device> enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: <pre>Device# configure terminal</pre>	Enters global configuration mode.
Step 3	voice service voip Example: <pre>Device(config)# voice service voip</pre>	Enters voice service VoIP configuration mode.
Step 4	sip Example: <pre>Device(conf-voi-serv)# sip</pre>	Enters voice service SIP configuration mode.
Step 5	registration passthrough rate-limit expires <i>value</i> local-fallback <i>tag</i> Example: <pre>Device(conf-serv-sip)# registration passthrough rate-limit expires 3600 local-fallback 3</pre>	Configures the SIP registration passthrough rate-limit expiry value for local-fallback (e2e). Although CUBE receives the REGISTER message every 5 minutes (300 seconds), it will send only one register message every one hour. <ul style="list-style-type: none"> • Under dial peer configuration mode, you can use the voice-class sip registration passthrough rate-limit expires <i>value</i> reg-sync <i>dial-peer-tag</i> command.
Step 6	end Example:	Returns to privileged EXEC mode.

Command or Action	Purpose
<code>Device(conf-serv-sip)# end</code>	

Configure the Class of Restrictions (COR) List

Class of Restrictions (COR) provides the ability to deny certain call attempts based on the incoming and outgoing class of restrictions that are provisioned on the dial peers.

COR specifies which incoming dial peer can use which outgoing dial peer to make a call. You can provision each dial peer with an incoming and an outgoing COR list. The incoming COR list indicates the capability of the dial peer to initiate certain classes of calls. The outgoing COR list indicates the capability that is required for an incoming dial peer to deliver a call through this outgoing dial peer.

Before you begin

You must configure COR Groups. For more information, see [Dial Peer Configuration Guide](#).

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **dial-peer voice *tag* voip**
4. **corlist incoming *dial-peer***
5. **corlist outgoing *dial-peer***
6. **description *string***
7. **destination-pattern *number***
8. **session protocol sipv2**
9. **session target registrar**
10. **voice-class sip registration passthrough local-fallback *tag***
11. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: <code>Device> enable</code>	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: <code>Device# configure terminal</code>	Enters global configuration mode.
Step 3	dial-peer voice <i>tag</i> voip Example:	Enters dial peer configuration mode.

	Command or Action	Purpose
	<code>Device(config)# dial-peer voice 3 voip</code>	
Step 4	corlist incoming <i>dial-peer</i> Example: <code>Device(config-dial-peer)# corlist incoming FromPhone</code>	Specifies the COR to be applied on an incoming dial peer (for incoming calls).
Step 5	corlist outgoing <i>dial-peer</i> Example: <code>Device(config-dial-peer)# corlist outgoing FromSP</code>	Specifies the COR to be applied for outgoing dial peer (for outgoing calls).
Step 6	description <i>string</i> Example: <code>Device(config-dial-peer)# description registration</code>	Adds a description to a dial peer.
Step 7	destination-pattern <i>number</i> Example: <code>Device(config-dial-peer)# destination-pattern 1111</code>	Specifies either the prefix or the full E.164 phone number to be used for the dial peer.
Step 8	session protocol sipv2 Example: <code>Device(config-dial-peer)# session protocol sipv2</code>	Specifies the session protocol for SIP calls between local and remote devices using the packet network.
Step 9	session target registrar Example: <code>Device(config-dial-peer)# session target registrar</code>	Specifies to route the call to the registrar endpoint for SIP dial peers.
Step 10	voice-class sip registration passthrough local-fallback <i>tag</i> Example: <code>Device(config-dial-peer)# voice-class sip registration passthrough local-fallback 5</code>	Configures SIP registration passthrough for local fallback mode.
Step 11	end Example: <code>Device(config-dial-peer)# end</code>	Returns to privileged EXEC mode.

Verify Survivability

The **show** commands can be entered in any order.

SUMMARY STEPS

1. **enable**
2. **show dial-peer voice summary**
3. **show sip-ua registration passthrough status**
4. **show sip-ua register status**
5. **show voip rtp connections**
6. **show call active voice compact**

DETAILED STEPS

Step 1 enable

Enables privileged EXEC mode.

Example:

```
Device> enable
```

Step 2 show dial-peer voice summary

Displays the summary information for each voice dial peer.

Example:

```
Device# show dial-peer voice summary
```

```
dial-peer hunt 0
          AD
TAG      TYPE  MIN  OPER PREFIX  DEST-PATTERN  PRE PASS          OUT
1        voip  up   up      1111...      0  syst registrar
2        voip  up   down    1.....      0  syst ipv4:10.104.45.253      busyout
1000     voip  down down    9900...      0  syst ipv4:9.0.0.174:30601
101      voip  down down    1.....      0  syst ipv4:10.104.45.31
102      voip  down down    11.....      0  syst ipv4:10.104.45.253
300      voip  down down    .T           0  syst
400      voip  down down    11110...     0  syst registrar
```

Step 3 show sip-ua registration passthrough status

Displays information about the SIP user agent registration passthrough status. In the sample output shown below, the parameter In-Exp shows the remaining expiry time and the survival field parameters can be regsync, locfall, or normal.

Example:

```
Device# show sip-ua registration passthrough status
```

```
CallId      Line      peer      mode In-Exp      reg-I Out-Exp survival
=====
5300        1111008   1         e2e  1041 /1200  ----- 1200  normal *
5305        1111002   1         e2e  2847 /3000  ----- 3000  normal *
```



```
5311          1111020      1          e2e 1070 /1200  ----- 1200   normal *
```

Step 4 show sip-ua register status

Displays information about the SIP user agent register status.

Example:

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

```
Line          peer  expires(sec)  reg survival P-Associ-URI
=====
11123         23    59           yes  regsync
```

Step 5 show voip rtp connections

Displays Real-Time Transport Protocol (RTP) named event packets.

Example:

```
Device# show voip rtp connections
```

```
VoIP RTP Port Usage Information:
Max Ports Available: 8091, Ports Reserved: 101, Ports in Use: 2
Port range not configured, Min: 16384, Max: 32767
```

Ports	Ports	Ports
Media-Address	Range	Available
Reserved	In-use	
Default Address-Range		8091
101	2	

```
VoIP RTP active connections :
No. CallId    dstCallId  LocalRTP  RmtRTP  LocalIP          RemoteIP
1    5324      5325      16410   16464   9.40.1.168      9.40.1.173
2    5325      5324      16412   16528   9.40.1.168      9.40.1.174
Found 2 active RTP connections
```

Step 6 show call active voice compact

Displays the compact version of the call information for voice calls in progress.

Example:

```
Device# show call active voice compact
```

```
<callID>  A/O FAX T<sec> Codec      type      Peer Address      IP R<ip>:<udp>
Total call-legs: 2
          5324 ANS   T9    g711ulaw  VOIP      P1111008          9.40.1.173:16464
          5325 ORG   T9    g711ulaw  VOIP      P1111020          9.40.1.174:16528
```

Configuration Examples—Survivability for Hosted and Cloud Services

Example: Configuring Local Fallback Globally

In the following example, local fallback is configured at global level:

```
Device> enable
Device# configure terminal
Device(config)# voice service voip
Device(conf-voi-serv)# sip
Device(conf-serv-sip)# registration passthrough local-fallback 10
Device(config-serv-sip)# end
```

Example: Configuring Local Fallback at the Tenant Level

In the following example, local fallback is configured for tenant 1 and is applied for dial-peer 444:

```
Device>enable
Device#configure terminal
Device(config)#voice class tenant 1
Device(config-class)#registration passthrough local-fallback 10
Device(config-class)#exit
Device(config)#dial-peer voice 444 voip
Device(config-dial-peer)#voice-class sip tenant 1
Device(config-class)# exit
```

Example: Configuring Local Fallback on a Dial Peer

In the following example, local fallback is configured on dial-peer 2.

```
Device> enable
Device# configure terminal
Device(config)# dial-peer voice 2 voip
Device(config-dial-peer)# voice-class sip registration passthrough local-fallback 10
Device(config-dial-peer)# end
```

Example: Configuring Survivability for Phones Sending Single Register Request

In the following example, survivability is configured for phones sending single register request:

```
Device> enable
Device# configure terminal
Device(config)# voice service voip
Device(conf-voi-serv)# sip
```

```
Device(conf-serv-sip)# survivability single-register
Device(config-serv-sip)# end
```

Example: Configuring OPTIONS Ping

In the following example, OPTIONS Ping is configured on dial-peer 3:

```
Device> enable
Device# configure terminal
Device(config)# dial-peer voice 3 voip
Device(config-dial-peer)# voice-class sip options-keepalive up-interval 120 down-interval
120
Device(config-dial-peer)# end
```

Example: Configuring the Registration Timer

In the following example, registration timer is configured with a expiration value of minimum 200 and maximum 300 seconds.

```
Device> enable
Device# configure terminal
Device(config)# voice service voip
Device(conf-voi-serv)# sip
Device(conf-serv-sip)# registrar server expires max 300 min 200
Device(conf-serv-sip)# end
```

Example: Configuring REGISTER Message Throttling

In the following example, REGISTER message throttling is configured:

```
Device>enable
Device#configure terminal
Device(config)#voice service voip
Device(conf-voi-serv)#sip
Device(conf-serv-sip)#registration passthrough rate-limit expires 3600 local-fallback 3
Device(conf-serv-sip)#end
```

Example: Configuring the COR List

In the following example, "FromPhone" and "FromSP" COR groups are configured and applied to dial-peer 2:

```
Device>enable
Device# configure terminal
Device(config)#dial-peer cor list FromPhone
Device(config-dp-corlist)#member 911
Device(config-dp-corlist)#member 1800
Device(config)#dial-peer cor list FromSP
```

```
Device(config-dp-corlist)#member 911
Device(config-dp-corlist)#member 1800
Device(config-dp-corlist)#exit
Device(config)# dial-peer voice 2 voip
Device(config-dial-peer)# corlist incoming FromPhone
Device(config-dial-peer)# corlist outgoing FromSP
Device(config-dial-peer)# description registration
Device(config-dial-peer)# destination-pattern 1111
Device(config-dial-peer)# session protocol sipv2
Device(config-dial-peer)# session target registrar
Device(config-dial-peer)# voice-class sip registration passthrough local-fallback 5
Device(config-dial-peer)# end
```