



Survivability Enhancements

When a WAN link goes down temporarily or the registrar server is down, local calls cannot be made and no calls can be routed to and from the phones. The Survivability Enhancements feature on the Nano CUBE is used to:

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

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

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.

Information About Survivability Enhancements

The survivability feature addresses the following issues:

- 1 When a WAN link or registrar server comes up, it needs to wait till 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 needs to wait that much time to reach that phone, after a link flap.
- 3 If the phone register timer setting is too small, it will flood the WAN link.
- 4 When the WAN link or registrar server is down, local calls cannot be made.

There are two ways to address these issues:

- Local fallback
- Registration synchronization

Local Fallback

- NanoCUBE does not need to configure credentials, as the phones will trigger registration. Although nanoCUBE receives REGISTER messages for each phone every 5 minutes; for example, it will throttle and send REGISTER messages every 1 hour to the registrar server, avoiding high WAN bandwidth usage. This will address 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.
- The OPTIONS ping is used to monitor the registrar server link status. When the detected link is down, NanoCUBE will reply with a 500 message and when the phone receives this message, it will send the REGISTER message to NanoCUBE, which is the secondary server (P2P registration). NanoCUBE will reply with a 200 OK message to P2P registration when the link is down. The dial-peer will keep dynamic registrar session target and the local call will not fail. This will address issue 4.

Registration Synchronization

- If you configure the phones to send REGISTER messages every 1 hour (to help alleviate the WAN link), the NanoCUBE uses the credentials 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 NanoCUBE keeps the registration database of the SIP phones previously registered successfully, and it does not send REGISTER messages out; NanoCUBE replies with a 200 OK message and dial-peer will keep the dynamic registrar session target. The local call will not fail, addressing issue 4.
- When the registrar link is up after link flap, the NanoCUBE 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 as well as the registrar. This addresses issues 1 and 2.

How to Configure Survivability Enhancements

Configuring 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: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
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.

	Command or Action	Purpose
		<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.

Configuring 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: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	dial-peer voice tag voip Example: Device(config)# dial-peer voice 4 voip	Enters dial peer VoIP configuration mode.

	Command or Action	Purpose
Step 4	voice-class sip registration passthrough local-fallback tag 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 tag command.
Step 5	end Example: <pre>Device(conf-serv-sip)# end</pre>	Returns to privileged EXEC mode.

Configuring 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.

	Command or Action	Purpose
Step 3	dial-peer voice <i>tag</i> voip Example: Device(config)# dial-peer voice 3 voip	Enters dial peer configuration mode.
Step 4	voice-class sip options-keepalive up-interval <i>value</i> down-interval <i>value</i> Example: Device(config-dial-peer)# voice-class sip options-keepalive up-interval 120 down-interval 120	Configures OPTIONS keepalive timer interval for DOWN and UP endpoints.
Step 5	end Example: Device(config-dial-peer)# end	Returns to privileged EXEC mode.

Configuring Registration Timer

Perform the following task to configure the registration timer in the NanoCUBE 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: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.

	Command or Action	Purpose
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	registrar server expires max <i>value</i> min <i>value</i> Example: Device(conf-serv-sip)# registrar server expires max 300 min 200	Configures the maximum and minimum time (in seconds) for the registration expiry in NanoCUBE. <ul style="list-style-type: none"> • If the phone sends expiry time as 600 seconds, then the NanoCUBE will reply with 200 OK message and expiry time 300 seconds, and the phone will resend with expiry 300.
Step 6	end Example: Device(conf-serv-sip)# end	Returns to privileged EXEC mode.

Configuring the REGISTER Message Throttling in Nano CUBE

Perform the following task to throttle the REGISTER message in Nano 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: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
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 rate-limit expires <i>value</i> local-fallback <i>tag</i> Example: Device(conf-serv-sip)# registration passthrough rate-limit expires 3600 local-fallback 3	Configures the SIP registration passthrough rate-limit expiry value for local-fallback (e2e). Although Nano 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 dial-peer-tag command.
Step 6	end Example: Device(conf-serv-sip)# end	Returns to privileged EXEC mode.

Configuring the Class of Restrictions (COR) List

Perform the following task to configure the COR list to allow the local call to go through the registrar.

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: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	dial-peer voice <i>tag</i> voip Example: Device(config)# dial-peer voice 3 voip	Enters dial peer configuration mode.
Step 4	corlist incoming <i>dial-peer</i> Example: Device(config-dial-peer)# corlist incoming FromPhone	Specifies the COR to be applied on an incoming dial peer (for incoming calls).
Step 5	corlist outgoing <i>dial-peer</i> Example: Device(config-dial-peer)# corlist outgoing FromSP	Specifies the COR to be applied for outgoing dial peer (for outgoing calls).

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

Verifying Survivability Enhancements

Perform this task to verify the configurations for the survivability enhancements. 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  FER  THRU  SESS-TARGET  OUT  STAT  PORT  KEEPALIVE
1        voip  up   up   1111...      1111...      0    syst  registrar
2        voip  up   down 1.....      1.....      0    syst  ipv4:10.104.45.253  busyout
1000     voip  down down 9900...      9900...      0    syst  ipv4:9.0.0.174:30601
101      voip  down down 1.....      1.....      0    syst  ipv4:10.104.45.31
102      voip  down down 11.....      11.....      0    syst  ipv4:10.104.45.253
300      voip  down down .T           .T           0    syst
400      voip  down down 11110...     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 for Survivability Enhancements

Example: Configuring Local Fallback Globally

```
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(conf-serv-sip)# end
```

Example: Configuring Local Fallback on a Dial Peer

```
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 OPTIONS Ping

```
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

```
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

```
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

```
Device> enable
Device# configure terminal
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
```

Feature Information for Survivability Enhancements

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 Enhancements

Feature Name	Releases	Feature Information
Survivability Enhancements	15.3(3)M	<p>When a WAN link goes down temporarily or the registrar server is down, local calls cannot be made and no calls can be routed to and from the phones. The Survivability Enhancements feature on the NanoCUBE is used to:</p> <ul style="list-style-type: none"> • Monitor the WAN status periodically from the Nano CUBE. • Route calls and handle line-seize subscriptions locally when the WAN link is down. • Synchronize the registrations with the server when the WAN link is up.