Configuring Loopback Call Routing

Last Updated: January 3, 2008

This chapter describes the loopback call-routing feature in Cisco Unified Communications Manager Express (Cisco Unified CME).

Finding Feature Information in This Module

Your Cisco Unified CME version may not support all of the features documented in this module. For a list of the versions in which each feature is supported, see the "Feature Information for Loopback Call Routing" section on page 1200.

Contents

Information About Loopback Call Routing

To enable loopback call routing, you should understand the following concept:

Loopback Call Routing

Loopback call routing in a Cisco Unified CME system is provided through a mechanism called loopback-dn, which provides a software-based limited emulation of back-to-back physical voice ports connected together to provide a loopback call-routing path for voice calls.

Loopback call routing and loopback-dn restricts the passage of call-transfer and call-forwarding supplementary service requests through the loopback. Instead of passing these requests through, the loopback-dn mechanism attempts to service the requests locally. This allows loopback-dn configurations to be used in call paths where one of the external devices does not support call transfer or call forwarding

(Cisco-proprietary or H.450-based). Control messages that request call transfer or call forwarding are intercepted at the loopback virtual port and serviced on the local voice gateway. If needed, this mechanism creates VoIP-to-VoIP call-routing paths.

Loopback call routing may be used for routing H.323 calls to Cisco Unity Express. For information on configuring Cisco Unity Express, see the Cisco Unity Express documentation.

Note A preferred alternative to loopback call routing was introduced in Cisco CME 3.1. This alternative blocks H.450-based supplementary service requests by using the following Cisco IOS commands: **no supplementary-service h450.2**, **no supplementary-service h450.3**, and **supplementary-service h450.12**. For more information, see "Configuring Call Transfer and Forwarding" on page 763.

Use of loopback-dn configurations within a VoIP network should be restricted to resolving critical network interoperability service problems that cannot otherwise be solved. Loopback-dn configurations are intended for use in VoIP network interworking where the alternative would be to make use of back-to-back-connected physical voice ports. Loopback-dn configurations emulate the effect of a back-to-back physical voice-port arrangement without the expense of the physical voice-port hardware. Because digital signal processors (DSPs) are not involved in loopback-dn arrangements, the configuration does not support interworking or transcoding between calls that use different voice codecs. In many cases, use of back-to-back physical voice ports that do involve DSPs to resolve VoIP network interworking issues is preferred, because it introduces fewer restrictions in terms of supported codecs and call flows.

Loopback call routing requires two extensions (ephone-dns) to be separately configured, each as half of a loopback-dn pair. Ephone-dns that are defined as a loopback-dn pair can only be used for loopback call routing. In addition to defining the loopback-dn pair, you must specify preference, huntstop, class of restriction (COR), and translation rules.

How to Configure Loopback Call Routing

This section contains the following tasks:

SCCP: Enabling Loopback Call Routing

To enable loopback call-routing, perform the following steps for each ephone-dn that is part of the loopback-dn pair.

Restrictions

Loopback-dns do not support T.38 fax relay.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ephone-dn** *dn-tag*

4. **number** *number* [**secondary** *number*] [**no-reg** [**both** | **primary**]]
5. **caller-id** {**local** | **passthrough**}
6. **no huntstop**
7. **preference** *preference-order* [**secondary** *secondary-order*]
8. **cor** {**incoming** | **outgoing**} *cor-list-name*
9. **translate** {**called** | **calling**} *translation-rule-tag*
10. **loopback-dn** *dn-tag* [**forward** *number-of-digits* | **strip** *number-of-digits*] [**prefix** *prefix-digit-string*] [**suffix** *suffix-digit-string*] [**retry** *seconds*] [**auto-con**] [**codec** {**g711alaw** | **g711ulaw**}]
11. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**ephone-dn** *dn-tag* **Example:** `Router(config)# ephone-dn 15`	Enters ephone-dn configuration mode, creates an ephone-dn, and optionally assigns it dual-line status. • *dn-tag*—Unique sequence number that identifies this ephone-dn during configuration tasks. Range is platform- and version-dependent. **Note** Ephone-dns used for loopback cannot be dual-line ephone-dns.
Step 4	**number** *number* [**secondary** *number*] [**no-reg** [**both** | **primary**]] **Example:** `Router(config-ephone-dn)# number 2001`	Associates a number with this extension (ephone-dn). • *number*—String of up to 16 digits that represents a telephone or extension number to be associated with this ephone-dn. • **secondary**—(Optional) Allows you to associate a second telephone number with an ephone-dn. • **no-reg**—(Optional) Specifies that this number should not register with the H.323 gatekeeper. The **no-reg** keyword by itself indicates that only the secondary number should not register. The **no-reg both** keywords indicate that both numbers should not register, and the **no-reg primary** keywords indicate that only the primary number should not register.

	Command or Action	Purpose
Step 5	**caller-id** {**local** | **passthrough**} **Example:** `Router(config-ephone-dn)# caller-id local`	Specifies caller-ID treatment for outbound calls originated from the ephone-dn. The default if this command is not used is as follows. For transferred calls, caller ID is provided by the number and name fields from the outbound side of the loopback-dn. For forwarded calls, caller ID is provided by the original caller ID of the incoming call. Settings for the **caller-id block** command and translation rules on the outbound side are executed. • **local**—Passes the local caller ID on redirected calls. This is the preferred usage. • **passthrough**—Passes the original caller ID on redirected calls.
Step 6	**no huntstop** **Example:** `Router(config-ephone-dn)# no huntstop`	Disables huntstop and allows call hunting behavior for an extension (ephone-dn).
Step 7	**preference** *preference-order* [**secondary** *secondary-order*] **Example:** `Router(config-ephone-dn)# preference 1`	Sets dial-peer preference for an extension (ephone-dn). • *preference-order*—Preference order for the primary number associated with an extension (ephone-dn). Range is 0 to 10, where 0 is the highest preference and 10 is the lowest preference. Default is 0. • **secondary** *secondary-order*—(Optional) Preference order for the secondary number associated with the ephone-dn. Range is 0 to 10, where 0 is the highest preference and 10 is the lowest preference. Default is 9.
Step 8	**cor** {**incoming** | **outgoing**} *cor-list-name* **Example:** `Router(config-ephone-dn)# cor incoming corlist1`	Applies a class of restriction (COR) to the dial peers associated with an extension. COR specifies which incoming dial peer can use which outgoing dial peer to make a call. Each dial peer can be provisioned with an incoming and an outgoing COR list. For information about COR, see "*Dial Peer Configuration on Voice Gateway Routers*".
Step 9	**translate** {**called** | **calling**} *translation-rule-tag* **Example:** `Router(config-ephone-dn)# translate called 1`	Selects an existing translation rule and applies it to a calling number or a number that has been called. This command enables the manipulation of numbers as part of a dial plan to manage overlapping or nonconsecutive numbering schemes. • **called**—Translates the called number. • **calling**—Translates the calling number. • *translation-rule-tag*—Unique sequence number of the previously defined translation rule. Range is 1 to 2147483647. **Note** This command requires that you have previously defined appropriate translation rules using the **voice translation-rule** and **rule** commands.

Command or Action	Purpose
Step 10 **loopback-dn** *dn-tag* [**forward** *number-of-digits* | **strip** *number-of-digits*] [**prefix** *prefix-digit-string*] [**suffix** *suffix-digit-string*] [**retry** *seconds*] [**auto-con**] [**codec** {**g711alaw** | **g711ulaw**}] **Example:** `Router(config-ephone-dn)# loopback-dn 24 forward 15 prefix 415353....`	Enables H.323 call transfer and call forwarding by using hairpin call routing for VoIP endpoints that do not support Cisco-proprietary or H.450-based call-transfer and call-forwarding. • *dn-tag*—Unique sequence number that identifies the ephone-dn that is being paired for loopback with the ephone-dn that is being configured. The paired ephone-dn must be one that is already defined in the system. • **forward** *number-of-digits*—(Optional) Number of digits in the original called number to forward to the other ephone-dn in the loopback-dn pair. Range is 1 to 32. Default is to forward all digits. • **strip** *number-of-digits*—(Optional) Number of leading digits to be stripped from the original called number before forwarding to the other ephone-dn in the loopback-dn pair. Range is 1 to 32. Default is to not strip any digits. • **prefix** *prefix-digit-string*—(Optional) Defines a string of digits to add in front of the forwarded called number. Maximum number of digits in the string is 32. Default is that no prefix is defined. • **suffix** *suffix-digit-string*—(Optional) Defines a string of digits to add to the end of the forwarded called number. Maximum number of digits in the string is 32. Default is that no suffix is defined. If you add a suffix that starts with the pound character (#), the string must be enclosed in quotation marks. • **retry** *seconds*—(Optional) Number of seconds to wait before retrying the loopback target when it is busy or unavailable. Range is 0 to 32767. Default is that retry is disabled and appropriate call-progress tones are passed to the call originator. • **auto-con**—(Optional) Immediately connects the call and provides in-band alerting while waiting for the far-end destination to answer. Default is that automatic connection is disabled. • **codec**—(Optional) Explicitly forces the G.711 A-law or G.711 mu-law voice coding type to be used for calls that pass through the loopback-dn. This overrides the G.711 coding type that is negotiated for the call and provides conversion from mu-law to A-law if needed. Default is that Real-Time Transport Protocol (RTP) voice packets are passed through the loopback-dn without considering the G.711 coding type negotiated for the calls. • **g711alaw—**G.711 A-law, 64000 bits per second, for T1. • **g711ulaw—**G.711 mu-law, 64000 bits per second, for E1.

	Command or Action	Purpose
Step 11	**end** **Example:** `Router(config-ephone-dn)# end`	Exits to privileged exec mode.

Verifying Loopback Call Routing

Step 1 Use the **show running-config** or **show telephony-service ephone-dn** command to display ephone-dn configurations.

Configuration Examples for Loopback Call Routing

This section contains the following example:

- Enabling Loopback Call Routing: Example, page 1198

Enabling Loopback Call Routing: Example

The following example uses ephone-dns 15 and 16 as a loopback-dn pair. Calls are routed through this loopback ephone-dn pair in the following way:

- An incoming call to 4085552xxx enters the loopback pair through ephone-dn 16 and exits the loopback via ephone-dn 15 as an outgoing call to 2xxx (based on the forward 4 digits setting).
- An incoming call to 6xxx enters the loopback pair through ephone-dn 15 and exits the loopback via ephone-dn 16 as an outgoing call to 4157676xxx (based on the prefix 415767 setting).

```
ephone-dn 15
 number 6...
 loopback-dn 16 forward 4 prefix 415767
 caller-id local
 no huntstop
!
ephone-dn 16
 number 4085552...
 loopback-dn 15 forward 4
 caller-id local
 no huntstop
```

Additional References

The following sections provide references related to Cisco Unified CME features.

Related Documents

Related Topic	Document Title
Cisco Unified CME configuration	• *Cisco Unified CME Command Reference* • Cisco Unified CME Documentation Roadmap
Cisco IOS commands	• *Cisco IOS Voice Command Reference* • Cisco IOS Software Releases 12.4T Command References
Cisco IOS configuration	• *Cisco IOS Voice Configuration Library* • Cisco IOS Software Releases 12.4T Configuration Guides
Phone documentation for Cisco Unified CME	• User Documentation for Cisco Unified IP Phones

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/techsupport

Feature Information for Loopback Call Routing

Table 64 lists the features in this module and enhancements to the features by version.

To determine the correct Cisco IOS release to support a specific Cisco Unified CME version, see the *Cisco Unified CME and Cisco IOS Software Version Compatibility Matrix* at http://www.cisco.com/en/US/docs/voice_ip_comm/cucme/requirements/guide/33matrix.htm.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 64 lists the Cisco Unified CME version that introduced support for a given feature. Unless noted otherwise, subsequent versions of Cisco Unified CME software also support that feature.

Table 64 Feature Information for Loopback Call Routing

Feature Name	Cisco Unified CME Version	Feature Information
Loopback Call Routing	2.0	Loopback call routing was introduced.