



## Setting Up the Network

This chapter describes how to configure your Cisco Unified Survivable Remote Site Telephony (SRST) router to run DHCP and to communicate with the IP phones during Cisco Unified Communications Manager fallback.

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### Information About Setting Up the Network

When the WAN link fails, the Cisco Unified IP Phones detect that they are no longer receiving keepalive packets from Cisco Unified Communications Manager. The Cisco Unified IP Phones then register with the router. The Cisco Unified SRST software is automatically activated and builds a local database of all Cisco Unified IP Phones attached to it (up to its configured maximum). The IP phones are configured to query the router as a backup call-processing source when the central Cisco Unified Communications Manager does not acknowledge keepalive packets. The Cisco Unified SRST router now performs call setup and processing, call maintenance, and call termination.

Cisco Unified Communications Manager uses DHCP to provide Cisco Unified IP Phones with the IP address of Cisco Unified Communications Manager. In a remote branch office, DHCP service is provided either by the SRST router itself or through the Cisco Unified SRST router using DHCP relay. Configuring DHCP is one of two main tasks in setting up network communication. The other task is configuring the Cisco Unified SRST router to receive messages from the Cisco IP phones through the specified IP addresses. Keepalive intervals are also set now.

### MGCP Gateways and SRST

MGCP fallback is a different feature than SRST and, when configured as an individual feature, can be used by a PSTN gateway. To use SRST as your fallback mode on an MGCP gateway, SRST and MGCP fallback must both be configured on the same gateway. MGCP and SRST have had the capability to be configured on the same gateway since Cisco IOS Release 12.2(11)T.

To make outbound calls while in SRST mode on your MGCP gateway, two fallback commands must be configured on the MGCP gateway. These two commands allow SRST to assume control over the voice port and over call processing on the MGCP gateway. With Cisco IOS earlier than 12.3(14)T, the two commands are the **ccm-manager fallback-mgcp** and **call application alternate** commands. With Cisco IOS releases after 12.3(14)T, the **ccm-manager fallback-mgcp** and **service** commands must be configured. A complete configuration for these commands is shown in the section the [Enabling Cisco Unified SRST on an MGCP Gateway](#) section.



**Note** The commands listed above are ineffective unless both commands are configured. For instance, your configuration will not work if you only configure the **ccm-manager fallback-mgcp** command.

For more information on the fallback methods for MGCP gateways, see [Configuring MGCP Gateway Support for Cisco Unified Communications Manager](#) document or the [MGCP Gateway Fallback Transition to Default H.323 Session Application](#) document.

## How to Set Up the Network

### Enabling Cisco Unified SRST on an MGCP Gateway

To use SRST as your fallback mode with an MGCP gateway, SRST and MGCP fallback must both be configured on the same gateway. The configuration in the following section allows SRST to assume control over the voice port and over call processing on the MGCP gateway. Due to command changes that were made in Cisco IOS Release 12.3(14)T, use the configuration task that corresponds with the Cisco IOS Release you have installed.



**Note** The commands in the configuration section are ineffective unless both commands are configured. For instance, your configuration will not work if you only configure the **ccm-manager fallback-mgcp** command.



**Note** When an MGCP-controlled PRI goes into SRST mode, do not make or save configuration changes to the NVRAM on the router. If configuration changes are made and saved in SRST mode, the MGCP-controlled PRI fails when normal MGCP operation is restored.

### Configuring Cisco Unified SRST on an MGCP Gateway Before Cisco IOS Release 12.3(14)T

Perform this task to enable SRST on an MGCP Gateway if you are using software release before Cisco IOS Release 12.3(14)T.

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ccm-manager fallback-mgcp**
4. **call application alternate** [ *application-name* ] OR **service** [**alternate** | **default** ] *service-name location*
5. **exit**

#### DETAILED STEPS

	Command or Action	Purpose
Step 1	enable	Enables privileged EXEC mode.

	Command or Action	Purpose
	<b>Example:</b> Router> enable	<ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>ccm-manager fallback-mgcp</b> <b>Example:</b> Router(config)# ccm-manager fallback-mgcp	Enables the gateway fallback feature and allows an MGCP voice gateway to provide call processing services through SRST or other configured applications when Cisco Unified Communications Manager is unavailable.
<b>Step 4</b>	<b>call application alternate</b> [ <i>application-name</i> ] OR <b>service</b> [ <b>alternate</b>   <b>default</b> ] <i>service-name location</i> <b>Example:</b> Router(config)# call application alternate OR Router(config)# service default	<p>The <b>call application alternate</b> command specifies that the default voice application takes over if the MGCP application is not available. The <i>application-name</i> argument is optional and indicates the name of the specific voice application to use if the application in the dial peer fails. If a specific application name is not entered, the gateway uses the default application.</p> <p>OR</p> <p>The <b>service</b> command loads and configures a specific, standalone application on a dial peer. The keywords and arguments are as follows:</p> <ul style="list-style-type: none"> <li>Alternate (Optional). Alternate service to use if the service configured on the dial peer fails.</li> <li>Default (Optional). Specifies that the default service <b>DEFAULT</b> on the dial peer is used if the alternate service fails.</li> <li>Service-name: Name that identifies the voice application.</li> <li>Location: Directory and filename of the Tel script or VoiceXML document in URL format. For example, flash memory <i>flash:filename</i>, a TFTP <i>tftp://../filename</i>, or an HTTP server <i>http://../filename</i> are valid locations.</li> </ul>
<b>Step 5</b>	<b>exit</b> <b>Example:</b> Router(config)# exit	Exits global configuration mode and returns to privileged EXEC mode.

## Configuring SRST on an MGCP Gateway Using Cisco IOS Release 12.3(14)T or Later Releases

Perform this task to enable SRST on an MGCP Gateway if you are using Cisco IOS Release 12.3(14)T or later version.

**Before you begin**

Effective with Cisco IOS Release 12.3(14)T, the call application alternate command is replaced by the service command. The service command can be used in all releases after Cisco IOS Release 12.3(14)T.

**SUMMARY STEPS**

1. **enable**
2. **configure terminal**
3. **ccm-manager fallback-mgcp**
4. **application** [ *application-name* ]
5. **global**
6. **service**[ *alternate* / *default* ] *service-name location*
7. **exit**

**DETAILED STEPS**

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"><li>• Enter your password if prompted.</li></ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>ccm-manager fallback-mgcp</b> <b>Example:</b> Router(config)# ccm-manager fallback-mgcp	Enables the gateway fallback feature and allows an MGCP voice gateway to provide call processing services through SRST or other configured applications when Cisco Unified Communications Manager is unavailable.
<b>Step 4</b>	<b>application</b> [ <i>application-name</i> ] <b>Example:</b> Router(config) application app-xfer	The <b>application-name</b> argument is optional and indicates the name of the specific voice application to use if the application in the dial peer fails. If a specific application name is not entered, the gateway uses the <b>DEFAULT</b> application.
<b>Step 5</b>	<b>global</b> <b>Example:</b> Router(config)# global	Enters global configuration mode.
<b>Step 6</b>	<b>service</b> [ <i>alternate</i> / <i>default</i> ] <i>service-name location</i> <b>Example:</b> Router(config) service myapp https://myserver/myfile.vxml	Loads and configures a specific, standalone application on a dial peer. <ul style="list-style-type: none"><li>• Alternate (Optional). Alternate service to use if the service configured on the dial peer fails.</li><li>• Default (Optional). Specifies that the default service <b>DEFAULT</b> on the dial peer is used if the alternate service fails.</li></ul>

	Command or Action	Purpose
		<ul style="list-style-type: none"> <li>• Service-name: Name that identifies the voice application.</li> <li>• Location: Directory and filename of the Tcl script or VoiceXML document in URL format. For example, flash memory <code>flash:filename</code>, a TFTP <code>tftp://../filename</code>, or an HTTP server <code>http://../filename</code> are valid locations.</li> </ul>
<b>Step 7</b>	<b>exit</b>  <b>Example:</b> Router(config)# exit	Exits global configuration mode and returns to privileged EXEC mode.

## Configuration Example of Enabling SRST on a MGCP Gateway using Cisco IOS Release 12.3(14)T

The following is an example of configuring SRST on an MGCP Gateway if you are using Cisco IOS Release 12.3(14)T or later release:

```

isdn switch-type primary-net5
!
!
ccm-manager fallback-mgcp
ccm-manager mgcp
ccm-manager config
mta receive maximum-recipients 0
!
controller E1 1/0
pri-group timeslots 1-12,16 service mgcp
!
controller E1 1/1
!
!
!
interface Ethernet0/0
ip address 10.48.80.9 255.255.255.0
half-duplex
!
interface Serial1/0:15
no ip address
no logging event link-status
isdn switch-type primary-net5
isdn incoming-voice voice
isdn bind-13 ccm-manager
no cdp enable
!
!
!
call rsvp-sync
!
call application alternate DEFAULT
!--- For Cisco IOS® Software Release 12.3(14)T or later,
this command was replaced by the service command
in global application configuration mode.
application
global
service alternate Default
!

```

```

voice-port 1/0:15
!
mgcp
mgcp dtmf-relay voip codec all mode cisco
mgcp package-capability rtp-package
mgcp sdp simple
!
mgcp profile default
!
!
!
dial-peer cor custom
!
!
!
dial-peer voice 10 pots
application mgcpapp
incoming called-number
destination-pattern 9T
direct-inward-dial
port 1/0:15
!
!
call-manager-fallback
limit-dn 7960 2
ip source-address 10.48.80.9 port 2000
max-ephones 10
max-dn 32
dialplan-pattern 1 704.... extension-length 4
keepalive 20
default-destination 5002
alias 1 5003 to 5002
call-forward busy 5002
call-forward noan 5002 timeout 12
time-format 24
!
!
line con 0
exec-timeout 0 0
line aux

```

## Configuring DHCP for Cisco Unified SRST Phones

To perform this task, you must have your network configured with DHCP. For further details about DHCP configuration, see the [Cisco IOS DHCP Server](#) document and see your Cisco Unified Communications Manager documentation.

When a Cisco IP phone is connected to the Cisco Unified SRST system, it automatically queries for a DHCP server. The DHCP server responds by assigning an IP address to the Cisco IP phone and providing the IP address of the TFTP server through DHCP option 150. Then, the phone registers with the Cisco Unified Communications Manager system server and attempts to get configuration and phone firmware files from the Cisco Unified Communications Manager TFTP server address provided by the DHCP server.

When setting up your network, configure your DHCP server local to your site. You may use your SRST router to provide DHCP service (recommended). If your DHCP server is across the WAN and there is an extended WAN outage, the DHCP lease times on your Cisco Unified IP Phones may expire. This may cause your phones to lose their IP addresses, resulting in a loss of service. Rebooting your phones when there is no DHCP server available after the DHCP lease has expired will not reactivate the phones, because they will be unable to obtain an IP address or other configuration information. Having your DHCP server local to your remote

site ensures that the phones can continue to renew their IP address leases in the event of an extended WAN failure.

Choose one of the following tasks to set up DHCP service for your Cisco Unified IP Phones:

- [Defining a Single DHCP IP Address Pool, on page 7](#)—Use this method if the Cisco Unified SRST router is a DHCP server and if you can use a single shared address pool for all your DHCP clients.
- [Defining a Separate DHCP IP Address Pool for Each Cisco Unified IP Phone, on page 8](#)—Use this method if the Cisco Unified SRST router is a DHCP server and you need separate pools for non-IP-phone DHCP clients.
- [Defining the DHCP Relay Server, on page 9](#)—Use this method if the Cisco Unified SRST router is not a DHCP server and you want to relay DHCP requests from IP phones to a DHCP server on a different router.

## Defining a Single DHCP IP Address Pool

This task creates a large shared pool of IP addresses in which all DHCP clients receive the same information, including the option 150 TFTP server IP address. The benefit of selecting this method is that you set up only one DHCP pool. However, defining a single DHCP IP address pool can be a problem if non-IP phone clients need to use a different TFTP server address.

### SUMMARY STEPS

1. **ip dhcp pool** *pool-name*
2. **network** *ip-address* [ *mask* / *prefix -length* ]
3. **option 150 ip** *ip-address*
4. **default-router** *ip-address*
5. **exit**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>ip dhcp pool</b> <i>pool-name</i> <b>Example:</b> Router(config)# ip dhcp pool mypool	Creates a name for the DHCP server address pool and enters DHCP pool configuration mode.
Step 2	<b>network</b> <i>ip-address</i> [ <i>mask</i> / <i>prefix -length</i> ] <b>Example:</b> Router(config-dhcp)# network 10.0.0.0 255.255.0.0	Specifies the IP address of the DHCP address pool and the optional mask or number of bits in the address prefix, preceded by a forward slash.
Step 3	<b>option 150 ip</b> <i>ip-address</i> <b>Example:</b> Router(config-dhcp)# option 150 ip 10.0.22.1	Specifies the TFTP server address from which the Cisco IP phone downloads the image configuration file. This needs to be the IP address of Cisco Unified CM.
Step 4	<b>default-router</b> <i>ip-address</i> <b>Example:</b>	Specifies the router to which the Cisco Unified IP phones are connected directly.

	Command or Action	Purpose
	<code>Router(config-dhcp) # default-router 10.0.0.1</code>	This router should be the Cisco Unified SRST router because this is the default address that is used to obtain SRST service in the event of a WAN outage. As long as the Cisco IP phones have a connection to the Cisco Unified SRST router, the phones are able to get the required network details.
<b>Step 5</b>	<b>exit</b> <b>Example:</b> <code>Router(config-dhcp) # exit</code>	Exits DHCP pool configuration mode.

## Defining a Separate DHCP IP Address Pool for Each Cisco Unified IP Phone

This task creates a name for the DHCP server address pool and specifies IP addresses. This method requires you to make an entry for every Cisco Unified IP phone.

### SUMMARY STEPS

1. **ip dhcp pool***pool-name*
2. **host** *ip-address subnet-mask*
3. **option 150 ip** *ip-address*
4. **default-router** *ip-address*
5. **exit**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>ip dhcp pool</b> <i>pool-name</i> <b>Example:</b> <code>Router(config) # ip dhcp pool pool2</code>	Creates a name for the DHCP server address pool and enters DHCP pool configuration mode.
<b>Step 2</b>	<b>host</b> <i>ip-address subnet-mask</i> <b>Example:</b> <code>Router(config-dhcp) # host 10.0.0.0 255.255.0.0</code>	Specifies the IP address that you want the phone to use.
<b>Step 3</b>	<b>option 150 ip</b> <i>ip-address</i> <b>Example:</b> <code>Router(config-dhcp) # option 150 ip 10.0.22.1</code>	Specifies the TFTP server address from which the Cisco IP phone downloads the image configuration file. This needs to be the IP address of Cisco Unified CM.
<b>Step 4</b>	<b>default-router</b> <i>ip-address</i> <b>Example:</b> <code>Router(config-dhcp) # default-router 10.0.0.1</code>	<p>Specifies the router to which the Cisco Unified IP phones are connected directly.</p> <p>This router should be the Cisco Unified SRST router because this is the default address that is used to obtain SRST service in the event of a WAN outage. As long as the Cisco IP phones have a connection to the Cisco Unified</p>



	Command or Action	Purpose
		SRST router, the phones are able to get the required network details.
<b>Step 5</b>	<b>exit</b> <b>Example:</b> Router(config-dhcp)# exit	Exits DHCP pool configuration mode.

## Defining the DHCP Relay Server

This task sets up DHCP relay on the LAN interface where the Cisco Unified IP phones are connected and enables the Cisco IOS DHCP server feature to relay requests from DHCP clients (phones) to a DHCP server. For further details about DHCP configuration, see the [Cisco IOS DHCP Server](#) document. The Cisco IOS DHCP server feature is enabled on routers by default. If the DHCP server is not enabled on your Cisco Unified SRST router, use the following steps to enable it.

### SUMMARY STEPS

1. **service dhcp**
2. **interface** *type number*
3. **ip helper-address** *ip-address*
4. **exit**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>service dhcp</b> <b>Example:</b> Router(config)# service dhcp	Enables the Cisco IOS DHCP Server feature on the router.
<b>Step 2</b>	<b>interface</b> <i>type number</i> <b>Example:</b> Router(config)# interface serial 0	Enters interface configuration mode for the specified interface. See <a href="#">Cisco IOS Interface and Hardware Component Command Reference, Release 12.3T</a> for more information.
<b>Step 3</b>	<b>ip helper-address</b> <i>ip-address</i> <b>Example:</b> Router(config-if)# ip helper-address 10.0.22.1	Specifies the helper address for any unrecognized broadcast for TFTP server and Domain Name System (DNS) requests. For each server, a separate <b>ip helper-address</b> command is required if the servers are on different hosts. You can also configure multiple TFTP server targets by using the <b>ip helper-address</b> command for multiple servers.
<b>Step 4</b>	<b>exit</b> <b>Example:</b> Router(config-if)# exit	Exits interface configuration mode.

## Specifying Keepalive Intervals

The keepalive interval is the period of time between keepalive messages sent by a network device. A keepalive message is a message sent by one network device to inform another network device that the virtual circuit between the two is still active.



**Note** If you plan to use the default time interval between messages, which is 30 seconds, you do not have to perform this task.

### SUMMARY STEPS

1. **call-manager-fallback**
2. **keepalive** *seconds*
3. **exit**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>call-manager-fallback</b> <b>Example:</b> Router(config)# call-manager-fallback	Enters call-manager-fallback configuration mode.
<b>Step 2</b>	<b>keepalive</b> <i>seconds</i> <b>Example:</b> Router(config-cm-fallback)# keepalive 60	Sets the time interval, in seconds, between keepalive messages that are sent to the router by Cisco Unified IP Phones.  Seconds: Range is 10 to 65535. Default is 30.
<b>Step 3</b>	<b>exit</b> <b>Example:</b> Router(config-cm-fallback)# exit	Exits call-manager-fallback configuration mode.

#### Example

The following example sets a keepalive interval of 45 seconds:

```
call-manager-fallback
keepalive 45
```

#### What to do next

The next step is setting up the phone and getting a dial tone. For instructions, see the [Cisco Unified SIP SRST 4.1](#) section.