



Configuring Fax Rollover

This chapter explains how to configure fax rollover on an IP network.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.



Note

For more information about this and related Cisco IOS voice features, see the following:

- [Chapter 1, “Fax Services over IP Overview”](#)
 - Entire Cisco IOS Voice Configuration Library—including library preface and glossary, other feature documents, and troubleshooting documentation—at http://www.cisco.com/en/US/products/ps6441/prod_configuration_guide09186a0080565f8a.html.
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Prerequisites for Fax Rollover

- Configure your IP network and ensure that it is operational.

- Text fax relay and ensure that it is operational on the IP network. By making sure that fax relay is operational before beginning to configure the fax rollover application, you can keep fax configuration issues separate and make troubleshooting easier. For information about T.38 fax relay, see [Chapter 4, “Configuring T.38 Fax Relay.”](#)
- Test the store-and-forward fax application and ensure that it is operational on the IP network with a Simple Mail Transfer Protocol (SMTP) or an Extended Simple Mail Transfer Protocol (ESMTP) mail server. For more information about T.37 store-and-forward fax, see [Chapter 5, “Configuring T.37 Store and Forward Fax.”](#)

Restrictions for Configuring Fax Rollover

- On DSPM-549s, only high-complexity VCWare is supported.

Information About Fax Rollover

The on-ramp gateway receives fax calls at an E.164 number. The gateway attempts to route fax calls using fax relay. If the attempt fails, the call is forwarded to an SMTP server by a mail transfer agent (MTA) using T.37-standard protocols for store-and-forward fax.

How to Download the Fax Rollover Application File

The steps in this section explain how to download the TCL script and default audio prompt files used with the fax rollover application. You must download these files before you can configure the fax rollover application. The script is contained in a zip file on Cisco.com.

Once you have downloaded the TCL script file to a location that the gateway can access, you load the application on the router by providing an application name of your choice and a link to the TCL script file name and location. Loading the script is described in the configuration tasks. The Cisco IOS File System (IFS) reads the files, so any IFS-supported URL can be used as a location for the files. URLs can include TFTP, FTP, or a pointer to a device on the router. For more information, see the “Using URLs in IVR Scripts” section in the “Using TCL IVR Scripts” chapter in the [TCL IVR API Version 2.0 Programmer’s Guide](#).

Prerequisites

- Download the fax rollover application script to your TFTP server. For instructions on downloading the application script file, see the [“How to Download the Fax Rollover Application File” section on page 7-2](#).

SUMMARY STEPS

1. Log in to the Cisco.com website and go to <http://www.cisco.com/cgi-bin/tablebuild.pl/tclware>.
2. Select and download this zip file: TCLware.2.0.1.zip.
3. Unzip the files.
4. Move the application script file to a location that can be accessed by your gateway using a URL address.

DETAILED STEPS

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- Step 1** Log in to the Cisco website and go to <http://www.cisco.com/cgi-bin/tablebuild.pl/tclware>.
When you are logged in to the Cisco website, you can navigate to the TCLWare page from the Cisco home page by following this path: Technical Support / Software Center / Access Software / TCLWare.
- Step 2** Select and download this zip file: `TCLware.2.0.1.zip`.
When you are asked, provide the following information:
- Cisco Connection Online (CCO) server nearest your physical location
 - Where to save the files on your disk
- Step 3** Unzip the files.
The zip file that you download includes these files:
- Fax rollover application TCL script file
 - README file
- Step 4** Move the application script file to a location that can be accessed by your gateway using a URL address.
The URL of a TCL script is a standard URL that points to the location of the script. Examples include the following:
- `flash:myscript.tcl`—The script called `myscript.tcl` is located in Flash memory on the router.
 - `slot0:myscript.tcl`—The script called `myscript.tcl` is located in a device in slot 0 on the router.
 - `tftp://BigServer/myscripts/MouseTrap.tcl`—The script called `MouseTrap.tcl` is located in a server called `BigServer` in a directory within the `tftpboot` directory called `myscripts`.

**Note**

Flash memory is limited to 32 entries, which may prevent your loading all TCL and audio files there.

How to Configure Fax Rollover

**Note**

The instructions in this chapter assume that your packet network includes separate routers for on-ramp and off-ramp functions. For smaller networks that use a single router for both on-ramp and off-ramp functionality, follow both the on-ramp and the off-ramp instructions on the same router.

The following tasks configure fax rollover on an on-ramp gateway:

- [Task 1: Loading the Fax Rollover Application on the Gateway](#) (required)
- [Task 2: Configuring Dial Peers](#) (required)
- [Task 3: Configuring an Off-Ramp Gateway for Store-and-Forward Fax](#) (required)
- [Task 4: Verifying the Fax-Rollover Configuration](#) (required)

Task 1: Loading the Fax Rollover Application on the Gateway

Fax rollover is an IVR application that is written in a TCL script. The script must be downloaded from Cisco.com and installed on your network before the fax rollover application can be loaded on the gateway (see the “[How to Download the Fax Rollover Application File](#)” section on page 7-2). Once you have installed the script at a location that is accessible by the gateway, you load it using a name of your choice. All later commands that refer to the fax rollover application use the name that you select when you load the application on the gateway.

SUMMARY STEPS

1. **call application voice** *application-name location*

DETAILED STEPS

	Command	Purpose
Step 1	<p>call application voice <i>application-name location</i></p> <p>Example: Router(config)# call application voice rollover-app tftp://BigServer/myscripts/fax_roll_2.1.2.0.tcl</p>	<p>Defines a global name for the application and indicates the location or URL of the TCL script to be used for the fax rollover application. Arguments are as follows:</p> <ul style="list-style-type: none"> • <i>application-name</i>—Name that you are defining for the fax rollover application. It is used in all subsequent commands that call the application or pass parameters to it. • <i>location</i>—Location of the TCL script file in URL format. Valid locations are TFTP, FTP, and Flash.

Task 2: Configuring Dial Peers

Dial peers for the fax rollover application include at least one inbound dial peer to receive calls from the PSTN and at least two outbound dial peers, one for fax relay and one for store-and-forward fax, as explained below.

The inbound dial peer describes the inbound call leg from the telephony connection to the gateway and is called a plain old telephone service (POTS) dial peer. POTS dial peers define the characteristics of the telephony (PSTN) connection between the sending fax device or voice instrument and the gateway to the IP network. In general, the gateway uses the line characteristics defined by POTS dial peers to determine call type and call destination. The gateway then finds an outbound dial peer whose configured parameters match these attributes and routes the call to it. You can establish more than one POTS dial peer if you want different incoming calls to receive different handling. The fax rollover application is enabled on the inbound dial peer.

One of the two types of outbound dial peers in the gateway router is the Voice-over-IP (VoIP) dial peer, which describes the fax relay call leg that is outbound from the router. You configure this dial peer exactly as you would configure an ordinary VoIP dial peer for fax relay, which is described in [Chapter 4, “Configuring T.38 Fax Relay.”](#)

The second type of outbound dial peer on the on-ramp gateway is the Multimedia-Mail-over-IP (MMoIP) dial peer, which describes an IP call leg for store-and-forward fax. The MMoIP dial peer is configured with the `fax_on_vfc_onramp_app` IVR application in the outbound mode, which is the standard configuration for store-and-forward fax. For instructions on configuring the MMoIP dial peer, see [Chapter 5, “Configuring T.37 Store-and-Forward Fax.”](#)

Configuration of dial peers for fax rollover is described in the following sections:

- [Task 2A: Configuring Inbound POTS Dial Peers](#) (required)
- [Task 2B: Configuring Outbound VoIP Dial Peers for Fax Relay](#) (required)
- [Task 2C: Configuring Outbound MMoIP Dial Peers for Store-and-Forward Fax](#) (required)

Task 2A: Configuring Inbound POTS Dial Peers

The purpose of configuring inbound POTS dial peers is to associate a destination pattern and call type with each incoming call so that the call is properly routed to an outbound dial peer. The fax rollover application is enabled on the inbound POTS dial peer.



Note

When configuring store-and-forward fax on on-ramp gateways with voice DSPs, do not configure the **information-type fax** command on the POTS dial peer. If this command is configured, fax calls fail.

SUMMARY STEPS

1. **dial-peer voice** *tag pots*
2. **application** *application-name*
3. **direct-inward-dial**
4. **incoming called-number** *string*
5. **exit**

DETAILED STEPS

	Command	Purpose
Step 1	dial-peer voice <i>tag pots</i> Example: Router(config)# dial-peer voice 77 pots	Enters dial-peer configuration mode and defines a local dial peer that directs traffic to or from a POTS interface. Argument and keyword are as follows: <ul style="list-style-type: none"> • tag—Dial-peer identifier that consists of one or more digits. Valid entries are from 1 to 2147483647. • pots—This dial peer directs traffic to or from a POTS interface.
Step 2	application <i>application-name</i> Example: Router(config-dial-peer)# application rollover-app	Associates the fax rollover application with the dial peer. The argument is as follows: <ul style="list-style-type: none"> • application-name—Name that was defined for the fax rollover application using the call application voice command in Task 1: Loading the Fax Rollover Application on the Gateway.
Step 3	direct-inward-dial Example: Router(config-dial-peer)# direct-inward-dial	Enables the Direct Inward Dialing (DID) call treatment for incoming called numbers, in which the entire incoming dial string is used to find a matching outbound dial peer. The gateway does not present a dial tone to the caller and does not collect digits; the setup message contains all the digits necessary to route the call.

	Command	Purpose
Step 4	incoming called-number <i>string</i> Example: Router(config-dial-peer)# incoming called-number 14085557896	Defines the called number (dialed number identification service or DNIS) string. The called number is used to match the incoming call leg to an inbound dial peer. The argument is as follows: <ul style="list-style-type: none"> <i>string</i>—Incoming called telephone number. Valid entries are any series of digits that specify the E.164 telephone number.
Step 5	exit Example: Router(config-dial-peer)# exit	Exits dial-peer configuration mode.

Task 2B: Configuring Outbound VoIP Dial Peers for Fax Relay

The purpose of configuring an outbound VoIP dial peer for fax relay is to enable call handling from the on-ramp gateway to a destination in the packet network. For fax relay, this destination is typically an incoming dial peer on an off-ramp gateway.

To configure a VoIP dial peer for fax relay, follow the instructions in the “Task 1B: Configure one or more outbound VoIP dial peers” section in [Chapter 4, “Configuring T.38 Fax Relay.”](#)

Task 2C: Configuring Outbound MMoIP Dial Peers for Store-and-Forward Fax

The purpose of configuring an outbound MMoIP dial peer for store-and-forward fax is to enable call handling from the on-ramp gateway to a destination in the packet network. For store-and-forward fax, this destination is typically an SMTP or ESMTP server.

To configure an MMoIP dial peer for store-and-forward fax, follow the instructions for configuring an on-ramp gateway in [Chapter 5, “Configuring T.37 Store-and-Forward Fax.”](#)

Task 3: Configuring an Off-Ramp Gateway for Store-and-Forward Fax

Follow the instructions for configuring an off-ramp gateway in [Chapter 5, “Configuring T.37 Store-and-Forward Fax”](#) if you want off-ramp gateway functionality.

Task 4: Verifying the Fax-Rollover Configuration

The commands in this task help you verify that your configuration is correct.

SUMMARY STEPS

1. `show running-config`
2. `show dial-peer voice [tag] [summary]`
3. `show call application voice summary`

	Command	Purpose
Step 1	<code>show running-config</code> Example: Router# <code>show running-config</code>	Displays the gateway running configuration, including dial-peer configuration.
Step 2	<code>show dial-peer voice [tag] [summary]</code> Example: Router# <code>show dial-peer voice 24</code>	Displays configuration information for MMoIP, VoIP, and POTS dial peers to help you verify that dial peers are properly configured for all legs of voice and fax calls. The argument and keyword are as follows: <ul style="list-style-type: none"> • <i>tag</i>—Particular dial peer with an identifier that consists of one or more digits. Range: 1 to 2147483647. • summary—Brief form of the output.
Step 3	<code>show call application voice summary</code> Example: Router# <code>show call application voice summary</code>	Lists all voice applications that are loaded on the router to help you confirm that the scripts that you are interested in are loaded.

Minimum Configuration Tasks for Fax Rollover

The following steps are the minimum necessary to make the fax rollover application operational on your network. By initially performing a minimum configuration, you can verify the correct operation of the application before you configure its optional parameters. Note that the minimum configuration for fax rollover takes advantage of the default parameter values for the fax rollover application; using the defaults makes initial troubleshooting easier.

Prerequisites

- Configure and test both fax relay and store-and-forward fax on your network.

DETAILED STEPS

To minimally configure fax rollover, use the following commands, beginning in global configuration mode:

- Step 1** Load the fax rollover application onto the on-ramp gateway from the TFTP server. In this example, the TFTP server's IP address is 172.16.1.1, the script is fax_roll.2.1.2.0.tcl, and the script is located in script-directory.

Example:

```
Router(config)# call application voice fax_roll
tftpboot://172.16.1.1/script-directory/fax_roll.2.1.2.0.tcl
```

- Step 2** Configure at least one inbound POTS dial peer on the on-ramp gateway. The incoming called-number string specifies a pattern that represents either the prefix or the full E.164 telephone number (depending on your dial plan) that identifies the destination fax telephone number for this dial peer.

Example:

```
Router(config)# dial-peer voice 1 pots
Router(config-dial-peer)# application fax_roll
Router(config-dial-peer)# incoming called-number 75..
Router(config-dial-peer)# direct-inward-dial
Router(config-dial-peer)# exit
```

- Step 3** Configure at least one outbound VoIP dial peer for fax relay.

Example:

```
Router(config)# dial-peer voice 14152 voip
Router(config-dial-peer)# destination-pattern 75..
Router(config-dial-peer)# session target ras
Router(config-dial-peer)# fax protocol t38
```

- Step 4** Configure at least one outbound MMoIP dial peer for store-and-forward fax. The IVR application on this dial peer has a fixed name, and it is bundled with Cisco IOS software. You do not need to download this application or load it on the router. Note that this application name must be typed exactly as it appears; you cannot abbreviate it as you can other Cisco IOS command arguments.

In the following example, the address of the SMTP server is 172.16.2.10.

Example:

```
Router(config)# dial-peer voice 5 mmoip
Router(config-dial-peer)# application fax_on_vfc_onramp_app out-bound
Router(config-dial-peer)# destination-pattern 75..
Router(config-dial-peer)# information-type fax
Router(config-dial-peer)# session protocol smtp
Router(config-dial-peer)# session target ipv4:172.16.2.10
Router(config-dial-peer)# exit
```

- Step 5** Verify the fax rollover configuration on the on-ramp gateway.

Example:

```
Router# show running-config
.
.
.
ip domain-name abcwrecking.com
!
!
call application voice fax_roll tftpboot://172.16.1.1/script-directory/fax_roll.2.1.2.0.tcl
```

```

!
!
dial-peer voice 1 pots
  application fax_roll
  incoming called-number 75..
  direct-inward-dial

```

Configuration Example for Fax Rollover

The following example shows a set of three peers for T.38 fax rollover to T.37 fax. Rollover occurs when the destination fax line is busy. The **voice hunt user-busy** command must be set for T.38 rollover to T.37.

```

.
.
.
voice hunt user-busy
!
! Inbound peer for T.38/T.37 on-ramp rollover operation.
! This peer includes the TCL application for rollover operation.
dial-peer voice 70 pots
  application app_lib_rollover
  incoming called-number 5.....
  port 1/1:0
!
! Outbound peer for T.38 ingress gateway.
! This peer requires a lower preference number than the next matching peer.
dial-peer voice 71 voip
  preference 1
  destination-pattern 3746096
  session target ipv4:1.14.120.109
  fax protocol t38 ls_redundancy 0 hs_redundancy 0
!
! Outbound peer for T.37 on-ramp operation.
dial-peer voice 72 mmoip
  preference 2
! The application name below must be exactly as shown!
  application fax_on_vfc_onramp_app out-bound
  destination-pattern 3746096
  session target mailto:$d@mail-server.cisco.com
  information-type fax
.
.
.

```

