Configuring T.37 Store-and-Forward Fax

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Fax pass-through is a method for sending faxes over IP networks. This chapter describes the configuration of T.37 store-and-forward fax on H.323 and Session Initiation Protocol (SIP) networks. It includes the following features:

- Extended Simple Mail Transfer Protocol (ESMTP) Accounting in Store-and-Forward Fax
- T.37 Store-and-Forward Fax

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.

Prerequisites for Configuring T.37 Store-and-Forward Fax

- Ensure that your IP network is configured and operational.
- Ensure that your system meets the requirements for store-and-forward fax and supported call-control protocols.
- The T.37 on-ramp gateway requires the system to have at least 2 MB I/O memory and 8 MB process memory for a session. If either of these memory requirements are not met, the T.37 session will fail.

Restrictions for Configuring T.37 Store-and-Forward Fax

- T.37 store-and-forward fax is not supported on Media Gateway Control Protocol (MGCP) networks.

- For T.37 store-and-forward fax, Cisco does not support any encryption with the Simple Mail Transfer Protocol (SMTP) implementation.
- Cisco fax gateways support only the TIFF format described in RFC 2301, *File Format for Internet Fax* , and RFC 2302, Tagged *>Image File Format (TIFF)--Image/TIFF MIME Sub-Type Registration* with Profile S. The TIFF header offset must be less than 1 KB and the header must be at the top of the TIFF page.
- Cisco's implementation of T.37 does not provide support for the optional Error Correction Mode (ECM) feature found on most G3 fax machines. ECM retransmits any corrupted scan lines that make up the image on the fax page to ensure that fax communications are received error-free. In networks with impairments, the lack of ECM support does not allow fax page information to be corrected. In some cases, this can lead to fax pages that have image quality issues, incomplete attachments in the fax e-mail, or even failure of the fax call.
- SG3 faxes are not supported.

Information About T.37 Store-and-Forward Fax

The purpose of an on-ramp gateway in store-and-forward fax is to receive faxes from the PSTN or standard fax devices. The on-ramp gateway performs the following actions:

1. Converts a fax message into a TIFF file.
2. Creates a standard Multipurpose Internet Mail Extension (MIME) e-mail message.
3. Attaches the TIFF file to the e-mail message.
4. Forwards the e-mail message and attachment to the messaging infrastructure of a designated SMTP server, where the message is stored.

The on-ramp gateway uses the sending Message Transfer Agent (MTA) and dial peers to receive fax calls from the PSTN and to define delivery parameters for the resulting e-mail message to which the fax TIFF file is attached. MTAs define the following elements of e-mail messages to which fax TIFF files are attached:

- Originator
- Subject of the message
- Destination mail server
- Return path
- Postmaster (default mail station for undeliverable messages)
- E-mail header information
- Address to which any disposition notices are sent

A DSN message notifies the sender of an e-mail message that contains a fax TIFF image about the status of that message. DSNs are automatically generated by the SMTP server and are described in RFC 1891, RFC 1892, RFC 1893, and RFC 1894. The following states can be reported to the sender:

- Delay--Message delivery was delayed.
- Success--Message was successfully delivered to the recipient mailbox.

- Failure--SMTP server was unable to deliver the message to the recipient.

The on-ramp gateway security controls who can send fax messages over the packet network. On-ramp accounting keeps track of who uses the packet network resources and how long they use them. On-ramp security and accounting are facilitated by authentication, authorization, and accounting (AAA) security services using RADIUS or TACACS+ as the local security protocol. On-ramp gateway faxing is a client of either the RADIUS or the TACACS+ authentication server. User information is forwarded to the AAA interface, and authentication requests are forwarded to the security server.

Authentication must be completed before the first page of the faxed material is accepted by the Fax Application Process (FAP). If a response is not received from the AAA server before the first page is received, the fax modem or voice card disconnects the call.

RADIUS attributes define specific AAA elements in a user profile. The user profile is stored on the RADIUS server. The Cisco implementation of RADIUS supports Internet Engineering Task Force (IETF) and vendor-proprietary attributes. IETF RADIUS attribute 26 enables vendors to support extended attributes not suitable for general use. The Cisco fax applications use the RADIUS implementation of vendor-specific options in the recommended format.

The "RADIUS Vendor-Specific Attributes" appendix lists the supported vendor-specific options (subtype numbers from 3 through 21) using IETF RADIUS attribute 26 and the Cisco vendor-ID company code of 9.

There are two kinds of off-ramp fax messages:

- Faxes that originate in the PSTN. On entering a packet network, these faxes are converted to TIFF files that are attached to e-mail messages for their transit through the network.
- Faxes that originate from e-mail messages on a PC in the packet network.

Either type can be delivered to a PC on the network before reaching an off-ramp gateway. Upon reaching the off-ramp gateway, however, both types are converted to standard Group 3 fax format for transmission through the PSTN to terminating fax machines.

A basic e-mail operation that store-and-forward fax supports is MDN (return receipt). An MDN is sent to an e-mail originator when the e-mail recipient opens a fax e-mail. MDNs are described in RFC 2298, which also states that e-mail recipients must be able to disable the automatic generation of MDNs.

MDNs are initiated by the sending e-mail client. Return receipts are generated by the receiving e-mail client. Most PC-based e-mail software applications, such as Eudora, Netscape Messenger, and Microsoft Outlook, support MDNs.

Off-ramp security controls who can send outgoing fax messages and is facilitated by AAA security services using either RADIUS or TACACS+. Authentication begins as soon as a fax e-mail message header is received from the e-mail server on the off-ramp gateway. The off-ramp gateway does not dial the destination fax device until authentication for each fax mail is successfully completed.

On-Ramp and Off-Ramp Fax Machines

The transmitting gateway is referred to as an on-ramp gateway, and the terminating gateway is referred to as an off-ramp gateway.

- In on-ramp faxing, either a voice gateway handles incoming calls from a standard fax machine or the PSTN converts a traditional Group 3 fax to an e-mail message with a Tagged Image File Format (TIFF) attachment. The fax e-mail message and attachment are handled by an e-mail server while traversing the packet network and can be stored for later delivery or delivered immediately to a PC or to an off-ramp gateway.

- In off-ramp faxing, either a voice gateway handles calls going out from the network to a fax machine or the PSTN converts a fax e-mail with a TIFF attachment into a traditional fax format that can be delivered to a standard fax machine or the PSTN.

On-ramp and off-ramp faxing processes can be combined on a single gateway, or they can occur on separate gateways. Store-and-forward fax uses two different interactive voice response (IVR) applications for on-ramp and off-ramp functionalities. The applications are implemented in two Tool Command Language (Tcl) scripts that you download from Cisco.com.

The basic functionality of store-and-forward fax is facilitated through SMTP, along with an additional functionality that provides confirmation of delivery using existing SMTP mechanisms, such as ESMTP.

Dial Peer Parameters for T.37 Store-and-Forward Fax

Store-and-forward fax requires you to configure gateway dial peers and specify values for the following types of parameters:

- IVR application parameters and IVR security and accounting parameters--These items load applications on the router and enable authorization and accounting for applications.
- Fax parameters--These items specify the cover sheet and header information that appears on faxes generated in the packet network.
- Mail transfer agent (MTA) parameters--These items define delivery parameters for e-mail messages that accompany fax TIFF images.
- Message disposition notification (MDN) parameters--These items specify the generation of messages to notify e-mail originators of the delivery of their fax e-mail messages.
- Delivery status notification (DSN) parameters--These items instruct the SMTP server to send messages to e-mail originators to inform them of the status of their e-mail messages.
- Gateway security and accounting parameters--These items define authentication, authorization, and accounting (AAA) for faxes that enter or exit the packet network.

Fax calls from the PSTN enter the network through an on-ramp gateway, which is sometimes called an originating gateway. Fax calls exit the packet network to the PSTN through an off-ramp gateway, which is sometimes called a terminating gateway. In small networks, on-ramp and off-ramp functionalities can reside in the same gateway. For store-and-forward fax, each type of gateway is configured with two types of dial peers:

- The on-ramp gateway is configured with one or more plain old telephone system (POTS) dial peers to handle fax calls inbound to the gateway from the public switched telephone network (PSTN) and with one or more multimedia over IP (MMoIP) dial peers to direct calls outbound from the gateway to the network.
- The off-ramp gateway is configured with one or more MMoIP dial peers to handle fax calls inbound from the IP network and with one or more POTS dial peers to direct calls outbound through POTS voice ports to the PSTN.

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

How to Configure T.37 Store-and-Forward Fax

Downloading the T.37 Store-and-Forward Fax Scripts

You must download the Tcl scripts for the store-and-forward fax application; the scripts are contained in compressed zip files on Cisco.com. Save the downloaded files in a location that the gateway can access. The Cisco IOS File System (IFS) is used to read the files, so you can use any IFS-supported URL for the file location. URLs can include TFTP, FTP, or pointers to a device on the router. For more information, see the Tcl IVR API Version 2.0 Programmer's Guide.

SUMMARY STEPS

1. Log in to the Cisco website and go to http://www.cisco.com/cgi-bin/tablebuild.pl/tclware .
2. Select and download the following zip files which contain the T.37 applications.
3. Unzip the files.
4. Move the application script files to a location that can be accessed by your gateway using a standard URL that points to the location of the script. The following are examples:

DETAILED STEPS

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, 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 the following zip files which contain the T.37 applications.

- app-faxmail-onramp.2.0.1.2.zip (or a later version)
- app-faxmail-offramp.2.0.1.1.zip (or a later version)

When asked, provide the following information:

- The Cisco Connection Online (CCO) server nearest to your physical location
- The location to save the files on your disk

Step 3 Unzip the files.

The zip files that you download include the following files:

- T.37 on-ramp application Tcl script (app-faxmail-onramp.2.0.1.2.tcl or later)
- T.37 off-ramp application Tcl script (app-faxmail-offramp.2.0.1.1.tcl or later)
- README file

Step 4 Move the application script files to a location that can be accessed by your gateway using a standard URL that points to the location of the script. The following are examples:

- 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 you from loading all Tcl and audio files there.

Configuring an On-Ramp Gateway for T.37 Store-and-Forward Fax

On-ramp gateway configuration for store-and-forward fax consists of the following tasks:

Note The T.37 store-and-forward fax configuration tasks are the same for H.323 and SIP networks.

Note Starting with Cisco IOS Release 12.3(14)T, the **call application voice configuration** commands were restructured. Configuration commands for Cisco IOS Release 12.3(11)T and earlier are described in the "Fax and Modem Services over IP Overview" module.

Enabling T.37 Store-and-Forward Fax on the On-Ramp Gateway

Perform this task to enable T.37 store-and-forward fax by specifying the following information:

- A fully qualified domain name for the SMTP server
- Name and location of the T.37 application
- Type of T.37 processing to occur on this gateway
- Called subscriber number definition

Before you begin

- The T.37 application that processes fax calls on inbound POTS dial peers is an IVR application that is written in a Tool Command Language (Tcl) script. Download the script from Cisco.com and install it on your network before you load the T.37 application on the gateway (see the How to Configure T.37 Store-and-Forward Fax, on page 5).
- After you have installed the script at a location that is accessible to the gateway, load it using a name of your choice. All later commands that refer to this application use the name that you select when you load the application on the gateway.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip domain-name** *name*
4. **fax interface-type** {**fax-mail** | **modem**}
5. **fax receive called-subscriber** {**d** | *string*}

6. **application**
7. **service** *service-name location*
8. **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	**ip domain-name** *name* **Example:** `Router(config)# ip domain-name ABC.com`	Defines a default domain name that the Cisco IOS software uses to complete unqualified hostnames (without dotted-decimal domain names). • *name* --Default domain name used to complete unqualified hostnames. Do not include the initial period that separates an unqualified name from the domain name. **Note** Cisco AS5300 gateways must be reloaded for this command to take effect.
Step 4	**fax interface-type** {**fax-mail** | **modem**} **Example:** `Router(config)# fax interface-type fax-mail`	Enables the T.37 functionality and specifies the type of fax processing. • **fax-mail** --Uses voice cards for the T.37 interface. This is the default for all platforms except the Cisco AS5300 and for Cisco AS5300 gateways with VFC cards only. • **modem** --(Cisco AS5300 only) Uses modem cards for the T.37 interface. This is the default for Cisco AS5300 gateways with modem cards only or with a combination of modem and VFC cards. **Note** If you change the fax interface type with this command, the gateway must be reloaded for the new setting to take effect. **Note** Before Cisco IOS Release 12.2(8)T, this command was **fax interface-type** {**vfc** | **modem**}. The **vfc** keyword was replaced by the **fax-mail** keyword to better represent all platforms.

	Command or Action	Purpose
Step 5	**fax receive called-subscriber** {**d** | *string*} **Example:** `Router(config)# fax receive called-subscriber $d$`	Configures the on-ramp gateway to send the called subscriber identity (CSI) regardless of whether the off-ramp gateway is converting a fax TIFF file to a standard fax or sending an e-mail message as a fax. The CSI is the telephone number associated with the receiving fax device and it typically appears in the LCD of the sending fax device. • **d** --Wildcard that is replaced by the sender name in the To: field in the RFC 822 header. • *string* --Destination telephone number. Valid entries are the plus sign (+), numbers 0 through 9, and the space character. Use a plus sign as the first character to specify an E.164 phone number.
Step 6	**application** **Example:** `Router(config)# application`	Enters application configuration mode to configure voice applications and services.
Step 7	**service** *service-name location* **Example:** `Router(config-app)# service fax_detect flash:app_fax_detect.2.1.2.2.tcl`	Loads a VoiceXML document or Tcl script and defines its application name. • *service-name* --Name that identifies the voice application. This is a user-defined name and does not have to match the script name. • *location* --Directory and filename of the Tcl script or VoiceXML document in URL format. For example, Flash memory (flash:filename), a TFTP (tftp://../filename) or an HTTP server (http://../filename) are valid locations.
Step 8	**end** **Example:** `Router(config-app)# end`	Exits application configuration mode.

Configuring Dial Peers on the On-Ramp Gateway

The purpose for configuring on-ramp gateway dial peers is to allow the router to receive inbound fax traffic from the PSTN and to direct that traffic to the appropriate SMTP server.

This task consists of the following subtasks:

Note For typical network operations, we recommend that you use the default configuration for image resolution/encoding on outbound MMoIP dial peers.

Configuring One or More Inbound POTS Dial Peers

An inbound dial peer on an on-ramp gateway receives fax calls from the PSTN.

The gateway selects an inbound dial peer for a fax call by matching information elements in the call setup message with configured dial peer attributes. Several methods of matching are available, but for store-and-forward fax, we recommend using the **incoming called-number** command, which configures the gateway to use the called number or the Digital Number Identification Service (DNIS) to match a dial peer. This method is recommended because call setups always include DNIS information, and this attribute has matching priority over other methods.

Note To learn about other methods of dial peer matching, see the *Dial Peer Configuration on Voice Gateway Routers* document.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **dial-peer voice** *tag* **pots**
4. **service** *service-name*
5. **direct-inward-dial**
6. **incoming called-number** *string*
7. **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	**dial-peer voice** *tag* **pots** **Example:** `Router(config)# dial-peer voice 24 pots`	Enters dial-peer configuration mode and defines a local dial peer that directs traffic to or from a POTS interface. • *tag* --Dial-peer identifier that consists of one or more digits. Valid entries are from 1 to 2147483647. • **pots** --Specifies that this dial peer directs traffic to or from a POTS interface.
Step 4	**service** *service-name* **Example:**	Associates the on-ramp store-and-forward fax application with this dial peer.

	Command or Action	Purpose
	`Router(config-dial-peer)# service onramp-app`	
Step 5	**direct-inward-dial** **Example:** `Router(config-dial-peer)# direct-inward-dial`	Enables the direct inward dial (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.
Step 6	**incoming called-number** *string* **Example:** `Router(config-dial-peer)# incoming called-number 5105551212`	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. • *string* --The incoming called telephone number. Valid entries are any series of digits that specify the E.164 telephone number. **Note** A gateway that is used for both voice calls and inbound T.37 fax calls requires one inbound POTS dial peer for voice calls (without the application command) and one inbound POTS dial peer for T.37 fax calls (with the application command).
Step 7	**end** **Example:** `Router(config-dial-peer)# end`	Exits dial-peer configuration mode.

Configuring One or More Outbound MMoIP Dial Peers

The outbound MMoIP dial peer on an on-ramp gateway directs fax traffic through the IP network to an SMTP server.

Note For typical network operations, we recommend that you use the default configuration for image resolution/encoding on outbound MMoIP dial peers. You should only configure additional outbound MMoIP dial peers for troubleshooting or when you need to force a dial peer into a specific resolution/encoding while receiving a fax. Changing this configuration might cause fax negotiation failure.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **dial-peer voice** *tag* **mmoip**
4. **service fax_on_vfc_onramp_app out-bound**
5. **destination-pattern** [+]*string*[**T**]

6. **information-type fax**
7. **session protocol smtp**
8. **session target** {**mailto**:{*host-name* | **d** | **m**}*@domain-name*| **ipv4:** *destination-address* | **dns:**{**d.**| **e.** | **s.** | **u.**}*host-name*}
9. **image encoding** {**mh** | **mr** | **mmr** | **passthrough**}
10. **image resolution** {**fine** | **standard** | **super-fine** | **passthrough**}
11. **max-conn** *number*
12. **dsn** {**delay** | **failure** | **success**}
13. **mdn**
14. **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	**dial-peer voice** *tag* **mmoip** **Example:** `Router(config)# dial-peer voice 17 mmoip`	Enters dial-peer configuration mode and defines a local dial peer that directs traffic to or from an SMTP server. • *tag* --Dial-peer identifier that consists of one or more digits. Valid entries are from 1 to 2147483647. • **mmoip** --Specifies that this dial peer conducts traffic to or from an SMTP server.
Step 4	**service fax_on_vfc_onramp_app out-bound** **Example:** `Router(config-dial-peer)# service fax_on_vfc_onramp_app out-bound`	Names the IVR application to which calls from this dial peer are handed off. • **fax_on_vfc_onramp_app** --Name of the T.37 IVR application that handles calls on MMoIP dial peers. • **out-bound** --Instructs the application that the calls it handles are outbound from the dial peer. **Note** This application name must be typed exactly as it appears here; you cannot abbreviate it as you can do with other Cisco IOS command keywords.

	Command or Action	Purpose
		Note You must use the **fax interface-type fax-mail** command and reload the router to make the fax_on_vfc_onramp_app script available. See the Enabling T.37 Store-and-Forward Fax on the On-Ramp Gateway, on page 6.

Step 5	**destination-pattern** [+]*string*[**T**]
	Example:
	`Router(config-dial-peer)# destination-pattern 14085554321`
		Specifies a pattern that represents either the prefix or the full E.164 telephone number (depending on your dial plan) that identifies the destination store-and-forward fax telephone number on this dial peer. This pattern of numbers should fall within the pattern of numbers that was configured as the incoming called number on the inbound POTS dial peer.
		• + --(Optional) Plus sign indicates that an E.164 standard number follows. The plus sign (+) is not supported on the Cisco MC3810.
		• *string* --E.164 or private dialing plan telephone number. Valid entries are digits 0 through 9, letters A through D, and the following special characters:
		  • Asterisk (*) and pound sign (#) that appear on standard touch-tone dial pads. These characters cannot be used as leading characters in a string (for example, *650).
		  • Comma (,), which inserts a pause between digits.
		  • Period (.), which matches any entered digit (this character is used as a wildcard). The period cannot be used as a leading character in a string (for example, .650).
		• **T** --(Optional) Timer, or control, character that indicates that the destination-pattern value is a variable-length dial string. This instructs the router to collect dialed digits until the interdigit timer expires (10 seconds, by default) or until the termination character (#, by default) is dialed. The timer character must be a capital T.

Step 6	**information-type fax** **Example:** `Router(config-dial-peer)# information-type fax`	Identifies calls associated with this dial peer as being fax transmissions, and not voice calls.
Step 7	**session protocol smtp** **Example:** `Router(config-dial-peer)# session protocol smtp`	Specifies the session protocol for calls between the on-ramp gateway and the remote mail server as SMTP.

	Command or Action	Purpose
Step 8	**session target** {**mailto**:{*host-name* | **d** | **m**}*@domain-name*| **ipv4:** *destination-address* | **dns:**{**d.**| **e.** | **s.** | **u.**}*host-name*} **Example:** `Router(config-dial-peer)# session target mailto:$d$@abccompany.com`	Designates a network-specific address to receive calls from this dial peer (the SMTP server). • **mailto:** --Indicates that the argument that follows is an e-mail address. • **ipv4:** -- Indicates that the argument that follows is an IP address. • **dns:** --Indicates that the argument that follows is a router hostname to be resolved by the domain name server. • *host-name* --String that contains the hostname of the network-specific address to receive calls from this dial peer. • *@domain-name* --String that contains the domain name to be associated with the target address, preceded by the at sign (@); for example, @mycompany.com. • *destination-address* --String that contains the IP address of the network-specific address to receive calls from this dial peer. • **d.** --Wildcard that is replaced by the destination (called) number, followed by a period (.). • **e.** --Wildcard that is replaced by the digits in the called number in reverse order with periods added between the digits, followed by a period (.). • **m.** --Wildcard that is replaced by the redirecting dialed number (RDNIS) if present; otherwise, it is replaced by the gateway access number (dialed number, or DNIS), followed by a period (.). This wildcard is used only with the Fax Detection application. • **s.** --Wildcard that is replaced by the source destination pattern, followed by a period (.). • **u.** --Wildcard that is replaced by the unmatched portion of the destination pattern (such as a defined extension number), followed by a period (.).
Step 9	**image encoding** {**mh** | **mr** | **mmr** | **passthrough**} **Example:** `Router(config-dial-peer)# image encoding mh`	(Optional) Selects a specific encoding method for the fax TIFF images that are forwarded using this dial peer. • **mh** --Specifies Modified Huffman image encoding. This is the IETF standard. • **mr** --Specifies Modified Read image encoding.

	Command or Action	Purpose
		• **mmr** --Specifies Modified Modified Read image encoding. • **passthrough** --Specifies that the image is not to be modified by an encoding method. This is the default.
Step 10	**image resolution** {**fine** | **standard** | **super-fine** | **passthrough**} **Example:** `Router(config-dial-peer)# image resolution fine`	(Optional) Selects a specific resolution for the fax TIFF images that are forwarded using this dial peer. • **fine** --Fax TIFF image resolution is 204-by-196 pixels per inch. • **standard** --Fax TIFF image resolution is 204-by-98 pixels per inch. • **super-fine** --Fax TIFF image resolution is 204-by-391 pixels per inch. • **passthrough** --Resolution of the fax TIFF image is not to be altered. This is the default.
Step 11	**max-conn** *number* **Example:** `Router(config-dial-peer)# max-conn 248`	(Optional) Specifies the maximum number of simultaneous connections that are allowed to and from this dial peer. • *number* --Number of simultaneous connections. Ranges from 1 to 2147483647. Default: the **no** form of this command, meaning that an unlimited number of connections is permitted.
Step 12	**dsn** {**delay** | **failure** | **success**} **Example:** `Router(config-dial-peer)# dsn failure`	(Optional) Requests delivery status notification of e-mail with fax TIFF images to be sent to the address specified by the **mta send mail-from** command (the FROM address). DSN must be supported by the remote mail server. • **delay** --Requests the next-hop mailer to notify the FROM address if a mail message is delayed. Each mailer in the path to the recipient that supports the DSN extension receives the same request. • **failure** --Requests the next-hop mailer to notify the FROM address if the mail message is not delivered. Each mailer in the path to the recipient that supports the DSN extension receives the same request. • **success** --Requests the next-hop mailer to notify the FROM address if the mail message is successfully delivered. Each mailer in the path to the recipient that supports the DSN extension receives the same request. The default is **failure** and **success**.

	Command or Action	Purpose
		Note Select more than one notification option by reissuing the command. To discontinue a specific notification option, use the **no** form of the command for that specific keyword. **Note** In the absence of any other DSN settings (either **no dsn** or a mailer in the path that does not support the DSN extension), a failure to deliver always generates a nondelivery message, which is called a bounce.
Step 13	**mdn** **Example:** `Router(config-dial-peer)# mdn`	(Optional) Requests generation of an MDN by the mail user agent when the e-mail is processed (typically opened or read). The MDN is generated by the receiving mail user agent and sent to the address defined by the **mta send return-receipt-to** command. The return receipt must be supported and initiated by the receiving e-mail client.
Step 14	**end** **Example:** `Router(config-dial-peer)# end`	Exits dial-peer configuration mode.

Configuring MTA Parameters on the On-Ramp Gateway

Perform this task to configure parameter values associated with the MTA on the on-ramp gateway.

Note The **mta send mail-from username** and **mta send mail-from hostname** commands define the From: username. The To: address is defined using the **session target** command on the on-ramp gateway MMoIP dial peer.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **mta send server** {*host-name* | *ip-address*[**port** *port-number*]}
4. **mta send postmaster** *e-mail-address*
5. **mta send mail-from hostname** *string*
6. **mta send mail-from username** {*string* | **s**}
7. **mta send subject** *string*
8. **mta send origin-prefix** *string*
9. **mta send return-receipt-to** {**hostname** *string*| **username** *string*| **username s**}
10. **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	**mta send server** {*host-name* | *ip-address*[**port** *port-number*]} **Example:** `Router(config)# mta send server california.fax.com`	Specifies a destination server. This command can be repeated to define up to ten mail servers for backup purposes. DNS mail exchange (MX) records are not used to look up the hostnames provided to this command. • *host-name* --String that contains the name of the destination e-mail server. • *ip-address* --String that contains the IP address of the destination e-mail server. • **port** *port-number* --(Optional) Keyword-argument pair that designates a particular port for the e-mail server. The default is 25. **Note** When using this command, configure the gateway to perform name lookups using the **ip name-server** command.
Step 4	**mta send postmaster** *e-mail-address* **Example:** `Router(config)# mta send postmaster mailtop@mail23.abcorp.com`	Identifies where an e-mail message should be delivered (the mail server postmaster account) if the evaluated string from the **mta send mail-from** command or the Simple Mail Transfer Protocol (SMTP) server is blank. • *e-mail-address* --Character string that defines the address to which an undeliverable e-mail should be diverted (the mail server postmaster account).
Step 5	**mta send mail-from hostname** *string* **Example:** `Router(config)# mta send mail-from hostname newyork.fax.com`	Specifies the originator (host-name portion) of the e-mail fax message. This information appears in the RFC 822 From: field and the RFC 821 MAIL FROM field of the e-mail fax message. This information is also used for generating delivery status notifications (DSNs). When the **mta send mail-from hostname** command is configured, the configured hostname is used with the **mta send mail-from username** command to form a complete e-mail address, such as faxuser@onramp-gateway.com.

	Command or Action	Purpose
		• *string* --Character string that specifies the SMTP hostname or IP address of the e-mail originator. If you specify an IP address, you must enclose the IP address in brackets as follows: [xxx.xxx.xxx.xxx].
Step 6	**mta send mail-from username** {*string* | **s**} **Example:** `Router(config)# mta send mail-from username $s$`	(Optional) Specifies the originator (username portion) of the e-mail fax message. This information appears in the RFC 822 From: field and the RFC 821 MAIL FROM field of the e-mail fax message. This information is also used for generating DSNs. When the **mta send mail-from hostname** command is configured, the configured hostname is used with the **mta send mail-from username** command to form a complete e-mail address, such as faxuser@onramp-gateway.com. • *string* --Character string that specifies the user name of the e-mail originator. • **s** --Wildcard that specifies that the username is to be derived from the calling number. When the **s** keyword is used, a transmission report is sent to the originating fax machine.
Step 7	**mta send subject** *string* **Example:** `Router(config)# mta send subject "mail from joe"`	(Optional) Defines the text that appears in the Subject field of the e-mail message. • *string* --Character string that specifies the subject header of an e-mail message.
Step 8	**mta send origin-prefix** *string* **Example:** `Router(config)# mta send origin-prefix "Cisco-powered Fax System"`	(Optional) Defines additional identifying information to be prepended to the e-mail prefix header. • *string* --Character string to be added to the beginning of an e-mail prefix header. If the string contains spaces, the string value should be enclosed within quotation marks ("abc xyz").
Step 9	**mta send return-receipt-to** {**hostname** *string*| **username** *string*| **username s**} **Example:** `Router(config)# mta send return-receipt-to username $s$`	(Optional) Specifies the address to which message disposition notifications (MDNs) are sent. • **hostname** *string* --Text string that specifies the Simple Mail Transfer Protocol (SMTP) hostname or IP address to which MDNs are sent. If you specify an IP address, you must enclose the IP address in brackets as follows: [xxx.xxx.xxx.xxx]. • **username** *string* --Text string that specifies the sender username to which MDNs are sent. • **username s** --Wildcard that specifies that the username is derived from the calling number.

	Command or Action	Purpose
		Note To generate return receipts in off-ramp fax-mail messages, enable MDN in the MMoIP dial peer, as described in the Configuring One or More Outbound MMoIP Dial Peers, on page 10.
Step 10	**end** **Example:** `Router(config)# end`	Exits global configuration mode.

Configuring DSNs on the On-Ramp Gateway

The **dsn** command allows you to enable or disable the generation of DSNs for each state by reissuing the command and specifying a different notification option each time. To discontinue a specific notification option, use the **no** form of the command for that specific keyword.

For fax calls received at an on-ramp gateway, requests for DSNs are included as part of the fax-mail messages sent by the on-ramp gateway. DSN requests are generated only when the MMoIP dial peer that matches the fax call has been configured to enable DSNs (see the Configuring One or More Outbound MMoIP Dial Peers, on page 10).

DSNs are delivered to the sender that is defined in the **mta send mail-from** command.

Note The following steps are also used in other tasks, but they are repeated here to show the complete set of steps that are used to generate DSNs.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **mta send mail-from hostname** *string*
4. **mta send mail-from username** {*string* | **s**}
5. **dial-peer voice** *tag* **mmoip**
6. **dsn** {**delayed**| **failure** | **success**}
7. **end**

DETAILED STEPS

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

	Command or Action	Purpose
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**mta send mail-from hostname** *string* **Example:** `Router(config)# mta send mail-from hostname newyork.fax.com`	See the Configuring MTA Parameters on the On-Ramp Gateway, on page 15.
Step 4	**mta send mail-from username** {*string* | **s**} **Example:** `Router(config)# mta send mail-from username $s$`	See the Configuring MTA Parameters on the On-Ramp Gateway, on page 15.
Step 5	**dial-peer voice** *tag* **mmoip** **Example:** `Router(config)# dial-peer voice 24 mmoip`	Enters dial-peer configuration mode for the MMoIP dial peer. See the Configuring One or More Outbound MMoIP Dial Peers, on page 10.
Step 6	**dsn** {**delayed**| **failure** | **success**} **Example:** `Router(config-dial-peer)# dsn failure`	See the Configuring One or More Outbound MMoIP Dial Peers, on page 10.
Step 7	**end** **Example:** `Router(config -dial-peer) # end`	Exits dial-peer configuration mode.

Configuring Security and Accounting on the On-Ramp Gateway

Perform this task to configure security and accounting on the on-ramp gatway.

Note Steps 10 through 13 do not apply to Cisco AS5300 gateways with modem cards.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **aaa new-model**
4. **aaa authentication login fax radius**

5. **aaa accounting connection fax start-stop group radius**
6. **radius-server host** *ip-address* **auth-port** *number* **acct-port** *number*
7. **radius-server key** {**0** *string* | **7** *hidden-string*| *string*}
8. **radius-server vsa send accounting**
9. **radius-server vsa send authentication**
10. **mmoip aaa method fax authentication** *method-list-name*
11. **mmoip aaa receive-authentication enable**
12. **mmoip aaa method fax accounting** *method-list-name*
13. **mmoip aaa receive-accounting enable**
14. **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	**aaa new-model** **Example:** `Router(config)# aaa new-model`	Enables AAA security and accounting services.
Step 4	**aaa authentication login fax radius** **Example:** `Router(config)# aaa authentication login fax radius`	Defines a method list called fax in which RADIUS is defined as the only method of login authentication. **Note** The method list name (fax) must match the name used in the Configuring T.37 IVR Application Security and Accounting, on page 22.
Step 5	**aaa accounting connection fax start-stop group radius** **Example:** `Router(config)# aaa accounting connection fax start-stop group radius`	Defines the accounting method list called fax with RADIUS as a method and with an option to send both start and stop accounting records to the AAA server. **Note** The method list name (fax) must match the name used in Configuring T.37 IVR Application Security and Accounting, on page 22.
Step 6	**radius-server host** *ip-address* **auth-port** *number* **acct-port** *number* **Example:**	Identifies the RADIUS server and the ports that are used for authentication and accounting services. You can use multiple **radius-server host** commands to specify multiple

	Command or Action	Purpose
	`Router(config)# radius-server host 10.168.23.24 auth-port 1812 acct-port 1813`	hosts. The software searches for hosts in the order in which you specify them. • *ip-address* --IP address of the RADIUS server host. • *number* --Port number for authentication or accounting requests. If set to 0, the host is not used. If unspecified for authentication, the port number defaults to 1645. If unspecified for accounting, the port number defaults to 1646.
Step 7	**radius-server key** {**0** *string* | **7** *hidden-string*| *string*} **Example:** `Router(config)# radius-server key 0 3hd905kdh`	Sets the authentication and encryption key for all RADIUS communications between the router and the RADIUS daemon on the server. • **0** --Unencrypted (clear-text) shared key follows. • **7** --Hidden shared key follows. • *hidden-string* --Hidden shared key. • *string* --Unencrypted (clear-text) shared key.
Step 8	**radius-server vsa send accounting** **Example:** `Router(config)# radius-server vsa send accounting`	Enables the network access server to recognize and use accounting vendor-specific attributes (VSAs) as defined by RADIUS Internet Engineering Task Force (IETF) attribute 26. VSAs allow vendors to support their own extended attributes not suitable for general use.
Step 9	**radius-server vsa send authentication** **Example:** `Router(config)# radius-server vsa send authentication`	Enables the network access server to recognize and use authentication VSAs as defined by RADIUS IETF attribute 26.
Step 10	**mmoip aaa method fax authentication** *method-list-name* **Example:** `Router(config)# mmoip aaa method fax authentication fax`	Defines the name of the method list to be used for store-and-forward fax AAA authentication. The method list, which defines the type of authentication services provided for store-and-forward fax, is itself defined using the **aaa authentication** global configuration command. Unlike standard AAA (in which each defined method list can be applied to specific interfaces and lines), the AAA authentication method lists used in store-and-forward fax are applied globally on the gateway. • *method-list-name* --Character string that names a list of authentication methods to be used with store-and-forward fax.
Step 11	**mmoip aaa receive-authentication enable** **Example:**	Enables AAA authentication services if an AAA authentication method list has been defined using both the

	Command or Action	Purpose
	`Router(config)# mmoip aaa receive-authentication enable`	**aaa authentication** command and the **mmoip aaa method fax authentication** command.
Step 12	**mmoip aaa method fax accounting** *method-list-name* **Example:** `Router(config)# mmoip aaa method fax accounting fax`	Defines the name of the method list to be used for store-and-forward fax AAA accounting. The method list, which defines the type of accounting services provided for store-and-forward fax, is itself defined using the **aaa accounting** global configuration command. Unlike standard AAA (in which each defined method list can be applied to specific interfaces and lines), the AAA accounting method lists used in store-and-forward fax are applied globally on the gateway. • *method-list-name* --Character string that names a list of accounting methods to be used with store-and-forward fax.
Step 13	**mmoip aaa receive-accounting enable** **Example:** `Router(config)# mmoip aaa receive-accounting enable`	Enables on-ramp AAA accounting service if an AAA accounting method list has been defined using both the **aaa accounting** command and the **mmoip aaa method fax accounting** command.
Step 14	**end** **Example:** `Router(config)# end`	Exits global configuration mode.

Configuring T.37 IVR Application Security and Accounting

Perform this task to configure the specified T.37 IVR application to perform authentication and accounting tasks in conjunction with a RADIUS server.

Note The commands in this section configure an IVR application, and they are not supported by Cisco IOS help. For example, if you type **param accounting-list ?**, the Cisco IOS software does not supply a list of entries that are valid in place of the question mark because the IVR application commands pass parameters to the named Tcl script, rather than to the Cisco IOS software.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **application**
4. **service** *service-name location*
5. **param accounting enable**
6. **param accounting-list** *method-list-name*

7. **param authentication enable**
8. **param authen-list** *method-list-name*
9. **param authen-method** {**prompt-user** | **ani** | **dnis** | **gateway** | **redialer-id** | **redialer-dnis**}
10. **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	**application** **Example:** `Router(config)# application`	Enters application configuration mode to configure voice applications and services.
Step 4	**service** *service-name location* **Example:** `Router(config-app)# service fax_detect flash:app_fax_detect.2.1.2.2.tcl`	Loads a VoiceXML document or Tcl script and defines its application name. • *service-name* --Name that identifies the voice application. This is a user-defined name and does not have to match the script name. • *location* --Directory and filename of the Tcl script or VoiceXML document in URL format. For example, Flash memory (flash:filename), a TFTP (tftp://../filename) or an HTTP server (http://../filename) are valid locations.
Step 5	**param accounting enable** **Example:** `Router(config-app)# param accounting enable`	Enables AAA accounting for a Tcl application.
Step 6	**param accounting-list** *method-list-name* **Example:** `Router(config-app)# param accounting-list fax`	Defines the name of the accounting method list to be used for AAA with store-and-forward fax on a voice feature card (VFC). • *method-list-name* --Character string used to name a list of accounting methods to be used with store-and-forward fax.

	Command or Action	Purpose
		Note The method list name should match the name used in the Configuring Security and Accounting on the On-Ramp Gateway, on page 19.
Step 7	**param authentication enable** **Example:** `Router(config-app)# param authentication enable`	Enables AAA authentication for a Tcl application.
Step 8	**param authen-list** *method-list-name* **Example:** `Router(config-app)# param authen-list fax`	Specifies the name of an authentication method list for a Tcl application. • *method-list-name* --Character string used to name a list of authentication methods to be used with store-and-forward fax. **Note** The method list name should match the name used in the Configuring Security and Accounting on the On-Ramp Gateway, on page 19.
Step 9	**param authen-method** {**prompt-user** | **ani** | **dnis** | **gateway** | **redialer-id** | **redialer-dnis**} **Example:** `Router(config-app)# param authen-method ani`	Specifies the type of authentication method for the named application. • **prompt-user** --The user is prompted for the Tcl application account identifier. • **ani** --The calling-party telephone number (automatic number identification [ANI]) is used as the Tcl application account identifier. • **dnis** --The called party telephone number (dialed number identification service [DNIS]) is used as the Tcl application account identifier. • **gateway** --The router-specific name derived from the hostname and domain name is used as the Tcl application account identifier. It is displayed in the following format: router-name.domain-name. • **redialer-id** --The account string returned by the external redialer device is used as the Tcl application account identifier. In this case, the redialer ID is either the redialer serial number or the redialer account number. • **redialer-dnis** --The called party telephone number (DNIS) is used as the Tcl application account identifier captured by the redialer if a redialer device is present.

	Command or Action	Purpose
Step 10	**end** **Example:** `Router(config)# end`	Exits application configuration mode.

How to Configure an Off-Ramp Gateway for T.37 Store-and-Forward Fax

The purpose of an off-ramp gateway in store-and-forward fax is to receive fax e-mail messages and TIFF attachments from the packet network and transmit them to the PSTN for delivery to terminating fax machines.

The off-ramp gateway performs the following actions:

- Converts a TIFF file or fax e-mail to a standard Group 3 fax message. During off-ramp faxing, the gateway uses the receiving MTA and dial peers to convert a fax-mail TIFF file or plain text file into a standard fax format and then delivers it as a standard fax transmission.
- Appends headers and cover pages only for fax plain-text e-mail messages, as described in the Configuring Fax Headers and Cover Pages on the Off-Ramp Gateway, on page 32.
- Forwards fax messages to voice ports that interface with the PSTN, as configured in the dial peers.

Various aspects of the off-ramp gateway must be configured to enable the preceding actions. The off-ramp gateway uses dial peers to route calls to appropriate POTS voice ports. An IVR application handles the conversion of fax messages. In addition, you can configure the gateway to request notifications when the fax messages are delivered. AAA security and accounting are also important for off-ramp fax services.

The off-ramp gateway configuration for store-and-forward fax consists of the following tasks:

Note Starting with Cisco IOS Release 12.3(14)T, the **call application voice** configuration commands were restructured. This application guide uses the new command structure.

Enabling T.37 Store-and-Forward Fax on the Off-Ramp Gateway

Perform this task to enable T.37 store-and-forward fax by specifying the following information:

- A fully qualified domain name for the SMTP server
- The name and location of the T.37 application
- The type of T.37 processing to occur on this gateway
- Transmitting-subscriber number definition

Before you begin

This section describes prerequisites for enabling T.37 store-and-forward fax on the off-ramp gateway.

- The T.37 application that processes fax calls on inbound MMoIP dial peers is an IVR application written in a Tcl script. Download the script from Cisco.com and install it on your network before you load the T.37 application on the gateway (see the How to Configure T.37 Store-and-Forward Fax, on page 5).

- After you have installed the script at a location that is accessible to the gateway, load it using a name of your choice. All later commands that refer to this application will use the name that you select when you load the application on the gateway.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip domain-name** *name*
4. **fax interface-type** {**fax-mail** | **modem**}
5. **fax send transmitting-subscriber** {**s**| *string*}
6. **service**
7. **service** *service-name location*
8. **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	**ip domain-name** *name* **Example:** `Router(config)# ip domain-name ABC.com`	Defines a default domain name that the Cisco IOS software uses to complete unqualified hostnames (without dotted-decimal domain names). • *name* --Default domain name used to complete unqualified hostnames. Do not include the initial period that separates an unqualified name from the domain name. **Note** Cisco AS5300 gateways must be reloaded for this command to take effect.
Step 4	**fax interface-type** {**fax-mail**	**modem**} **Example:** `Router(config)# fax interface-type fax-mail`	Enables T.37 functionality and specifies the type of fax processing. • **fax-mail** --Uses voice cards for the T.37 interface. This is the default for all platforms except the Cisco AS5300 and for Cisco AS5300 gateways with VFC cards only. • **modem** --(Cisco AS5300 only) Uses modem cards for the T.37 interface. This is the default for Cisco AS5300

	Command or Action	Purpose
		gateways with modem cards only or with a combination of modem and VFC cards. **Note** If you change the fax interface type with this command, the gateway must be reloaded in order for the new setting to take effect. **Note** Before Cisco IOS Release 12.2(8)T, this command was **fax interface-type** {**vfc** | **modem**}. The **vfc** keyword was replaced by the **fax-mail** keyword to better represent all platforms.
Step 5	**fax send transmitting-subscriber** {**s**| *string*} **Example:** `Router(config)# fax send transmitting-subscriber $s$`	Configures the on-ramp gateway to send the transmitting subscriber number (TSI) regardless of whether the off-ramp gateway is converting a fax TIFF file to a standard fax or sending an e-mail message as a fax. The TSI is the telephone number associated with the transmitting, or sending, fax device and it typically appears in the LCD of the receiving fax device. • **s** --Wildcard that is replaced by the name in the From: field in the RFC 822 header. • *string* --Destination telephone number. Valid entries are the plus sign (+), numbers 0 through 9, and the space character. To specify an E.164 phone number, use a plus sign (+) as the first character.
Step 6	**service** **Example:** `Router(config)# service`	Specifies the configuration mode to enter voice applications and services.
Step 7	**service** *service-name location* **Example:** `Router(config-app)# service fax_detect flash:app_fax_detect.2.1.2.2.tcl`	Loads a VoiceXML document or Tcl script and defines its application name. • *service-name* --Name that identifies the voice application. This is a user-defined name and does not have to match the script name. • *location* --Directory and filename of the Tcl script or VoiceXML document in URL format. For example, Flash memory (flash:filename), a TFTP (tftp://../filename) or an HTTP server (http://../filename) are valid locations.
Step 8	**end** **Example:**	Exits application configuration mode.

	Command or Action	Purpose
	`Router(config)# end`	

Configuring Dial Peers on the Off-Ramp Gateway

The purpose for configuring off-ramp gateway dial peers is to allow the router to receive inbound fax traffic from an SMTP server in the packet network and to direct that traffic to voice ports that interface with the PSTN.

This task consists of the following subtasks:

Configuring One or More Inbound MMoIP Dial Peers

The inbound MMoIP dial peer on an off-ramp gateway receives fax traffic from an SMTP server in the packet network. Perform this task to configure inbound MMoIP dial peers.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **dial-peer voice** *tag* **mmoip**
4. **application** *application-name*
5. **incoming called-number** *string*
6. **information-type fax**
7. **image encoding** {**mh** | **mr** | **mmr** | **passthrough**}
8. **image resolution** {**fine** | **standard** | **super-fine** | **passthrough**}
9. **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	**dial-peer voice** *tag* **mmoip** **Example:** `Router(config)# dial-peer voice 29 mmoip`	Enters dial-peer configuration mode and defines a local dial peer that directs traffic to or from an SMTP server. • *tag* --Dial-peer identifier consisting of one or more digits. The range is from 1 to 2147483647. • **mmoip** --Specifies that this dial peer conducts traffic to or from an SMTP server.

	Command or Action	Purpose
Step 4	**application** *application-name* **Example:** `Router(config-dial-peer)# application offramp-app`	Names the IVR application to which calls from this dial peer are handed off.
Step 5	**incoming called-number** *string* **Example:** `Router(config-dial-peer)# incoming called-number 14085552345`	Defines the dialed number identification service (DNIS) string, or called fax telephone number. The called number is used to match the incoming call leg to an inbound dial peer. • *string* --Specifies the incoming called telephone number. Valid entries are any series of digits that specify the E.164 telephone number.
Step 6	**information-type fax** **Example:** `Router(config-dial-peer)# information-type fax`	Identifies calls associated with this dial peer as being fax transmissions, not voice calls.
Step 7	**image encoding** {**mh** | **mr** | **mmr** | **passthrough**} **Example:** `Router(config-dial-peer)# image encoding mh`	(Optional) Selects a specific encoding method for the fax TIFF images that are handled by this dial peer. • **mh** --Modified Huffman image encoding (IETF standard). • **mr** --Modified Read image encoding. • **mmr** --Modified Modified Read image encoding. • **passthrough** --Existing image is not modified. This is the default.
Step 8	**image resolution** {**fine** | **standard** | **super-fine** | **passthrough**} **Example:** `Router(config-dial-peer)# image resolution standard`	(Optional) Selects a specific resolution for the fax TIFF images that are handled by this dial peer. • **fine** --204-by-196 pixels per inch. • **standard** --204-by-98 pixels per inch. • **super-fine** --204-by-391 pixels per inch. • **passthrough** --Existing resolution is not altered. This is the default.
Step 9	**end** **Example:** `Router(config-dial-peer)# end`	Exits dial-peer configuration mode.

Configuring One or More Outbound POTS Dial Peers

The outbound POTS dial peer on an off-ramp gateway directs fax calls to a POTS interface. Perform this task to configure outbound POTS dial peers.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **dial-peer voice** *tag* **pots**
4. **destination-pattern** [+]*string*[**T**]
5. **port** *voice-port*
6. **prefix** *string*
7. **max-conn** *number*
8. **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	**dial-peer voice** *tag* **pots** **Example:** `Router(config)# dial-peer voice 54 pots`	Enters dial-peer configuration mode and defines a local dial peer that directs traffic to or from a POTS interface. • *tag* --Dial-peer identifier that consists of one or more digits. Valid entries are from 1 to 2147483647. • **pots** --Specifies that this dial peer directs traffic to or from a POTS interface.
Step 4	**destination-pattern** [+]*string*[**T**] **Example:** `Router(config-dial-peer)# destination-pattern 15175550119`	Identifies the E.164 or private dialing plan telephone number associated with this dial peer. For outbound dial peers, the destination-pattern string is matched against the called number (DNIS string). • + --(Optional) Plus sign, indicating that an E.164 standard number follows. The plus sign (+) is not supported on the Cisco MC3810. • *string* --E.164 or private dialing plan telephone number. Valid entries are digits 0 through 9, letters A through D, and the following special characters:

	Command or Action	Purpose
		• Asterisk (*) and pound sign (#) that appear on standard touch-tone dial pads. These characters cannot be used as leading characters in a string (for example, *650). • Comma (,), which inserts a pause between digits. • Period (.), which matches any entered digit (this character is used as a wildcard). The period cannot be used as a leading character in a string (for example, .650). • **T** --(Optional) Timer, or control, character that indicates that the destination-pattern value is a variable-length dial string. Instructs the router to collect dialed digits until the interdigit timer expires (10 seconds, by default) or until the termination character (#, by default) is dialed. The timer character must be a capital T.
Step 5	**port** *voice-port* **Example:** `Router(config-dial-peer)# port 1/0/1`	Maps the dial peer to a specific logical voice-port interface. • *voice-port* --Voice port to which traffic from this dial peer should be routed. Voice-port identifiers are platform-specific.
Step 6	**prefix** *string* **Example:** `Router(config-dial-peer)# prefix 9,`	(Optional) Specifies the prefix of the dialed digits associated with this dial peer. If you configure a prefix, when an outgoing call is initiated, the prefix string value is added to the telephone interface first, before the telephone number configured for this dial peer. • *string* --Characters that represent the prefix of the telephone number associated with the specified dial peer. Valid characters are 0 through 9, and comma (,). Use a comma to include a pause in the prefix.
Step 7	**max-conn** *number* **Example:** `Router(config-dial-peer)# max-conn 48`	(Optional) Specifies the maximum number of simultaneous connections that are allowed to and from this dial peer. • *number* --Number of simultaneous connections. The range is from 1 to 2147483647. The default is the **no** form of this command, which means that an unlimited number of connections is permitted.
Step 8	**end** **Example:** `Router(config)# end`	Exits dial-peer configuration mode.

Configuring Fax Headers and Cover Pages on the Off-Ramp Gateway

The purpose of this task is to create headers and cover pages for fax messages that originate from plain-text e-mail messages. This task does not apply to fax TIFF files because headers and cover pages are generated by the originating fax machines and also because the off-ramp gateway does not alter TIFF files when converting them.

This task consists of the following two subtasks:

Configuring Fax Header Parameters

For faxes in plain-text e-mails that originate in the packet network, the off-ramp gateway can append header information to the top of each faxed cover and text page.

Note Because the off-ramp gateway does not alter fax TIFF attachments, fax headers cannot be configured for faxes that are being converted from TIFF files to standard fax transmissions.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **fax send center-header** {**a** | **d** | **p** | **s** | **t** | *string*}
4. **fax send right-header** {**a** | **d** | **p** | **s** | **t** | *string*}
5. **fax send left-header** {**a** | **d** | **p** | **s** | **t** | *string*}
6. **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	**fax send center-header** {**a** | **d** | **p** | **s** | **t** | *string*} **Example:** `Router(config)# fax send center-header $d$`	Specifies the header information to be displayed in the center position. • **a** --Date. • **d** --Destination address. • **p** --Page count. • **s** --Sender address.

	Command or Action	Purpose
		• **t** --Transmission time. • *string* --Combination of text and tokens.
Step 4	**fax send right-header** {**a** | **d** | **p** | **s** | **t** | *string*} **Example:** `Router(config)# fax send right-header $t$`	Specifies the header information to be displayed on the right. • **a** --Date. • **d** --Destination address. • **p** --Page count. • **s** --Sender address. • **t** --Transmission time. • *string* --Combination of text and tokens.
Step 5	**fax send left-header** {**a** | **d** | **p** | **s** | **t** | *string*} **Example:** `Router(config)# fax send left-header $a$`	Specifies the header information to be displayed on the left. • **a** --Date. • **d** --Destination address. • **p** --Page count. • **s** --Sender address. • **t** --Transmission time. • *string* --Combination of text and tokens.
Step 6	**end** **Example:** `Router(config)# end`	Exits global configuration mode.

Configuring Fax Cover Page Parameters

For faxes from plain-text e-mail messages that originate in the packet network, the off-ramp gateway can create fax cover pages.

Note Because the off-ramp gateway does not alter fax TIFF attachments, cover pages cannot be configured for faxes that are being converted from TIFF files to standard fax transmissions.

The table below contains examples of entries in the e-mail To: field to control the generation of fax cover pages and explains how these entries relate to the **fax send coverpage enable** command.

Table 1: Sample To: Field Descriptions for Fax Cover Pages

To: Field Entry in Fax E-Mail Message	Description
`FAX=+1-312-555-0119@fax.com`	Fax sent to an E.164-compliant long distance telephone number in the United States. If the **fax send coverpage enable** command has been configured, store-and-forward fax generates a fax cover page.
`FAX=+1-312-555-0119/cover=no@fax.com`	Fax sent to an E.164-compliant long distance telephone number in the United States. In this example, the **fax send coverpage enable** command is superseded by the cover=no statement. No cover page is generated.
`FAX=+1-312-555-0119/cover=yes@fax.com`	Fax sent to an E.164-compliant long distance telephone number in the United States. In this example, the **fax send coverpage enable** command is superseded by the cover=yes statement. Store-and-forward fax generates a fax cover page.
`FAX=+49-515-555-0119@faxgateway.com`	Fax sent to an E.164-compliant long distance telephone number in Germany.
`FAX=+61-2-555-0119@fax.host.com`	Fax sent to an E.164-compliant long distance telephone number in Australia.
`FAX=+33-65-555-0119@fax.com`	Fax sent to an E.164-compliant long distance telephone number in France.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **fax send coverpage enable**
4. **fax send coverpage comment** *string*
5. **fax send coverpage show-detail**
6. **fax send coverpage email-controllable**
7. **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.

	Command or Action	Purpose
Step 3	**fax send coverpage enable** **Example:** `Router(config)# fax send coverpage enable`	Enables the off-ramp gateway to send cover sheets with faxes that originate from e-mail messages.
Step 4	**fax send coverpage comment** *string* **Example:** `Router(config)# fax send coverpage comment Fax Cover Sheet`	(Optional) Adds personalized text in the title field of a fax cover sheet generated by the gateway. • *string* --ASCII character string.
Step 5	**fax send coverpage show-detail** **Example:** `Router(config)# fax send coverpage show-detail`	(Optional) Prints all of the e-mail header information as part of the text on fax cover sheets generated by the gateway.
Step 6	**fax send coverpage email-controllable** **Example:** `Router(config)# fax send coverpage email-controllable`	(Optional) Allows the fax e-mail address to enable cover page generation on a per-recipient basis. This means that if an e-mail header has a parameter that sets cover to no or cover to yes, the setting for the **fax send coverpage enable** command is overridden. For example, if the address has the cover parameter set to no, the parameter overrides the setting for the **fax send coverpage enable** command and the off-ramp gateway does not generate a fax cover page. If the address has the cover parameter set to yes, the off-ramp gateway defers to the setting configured in the e-mail address and generates a cover page whether or not the **fax send coverpage enable** command has been used. The table above contains examples of entries in the e-mail To: field to control the generation of fax cover pages.
Step 7	**end** **Example:** `Router(config)# end`	Exits global configuration mode.

Configuring MTA Parameters on the Off-Ramp Gateway

Perform this task to configure the way in which the off-ramp gateway receives messages from the MTA. In store-and-forward fax, the MTA is the messaging infrastructure in the packet network that performs message routing, storage, and transport. The MTA can be either a standard Internet MTA (for example, UNIX sendmail) or a custom store-and forward fax software.

For added security, with the MTA, you can define SMTP host aliases that are different from the normal host-name system (DNS) hostnames on your network. The gateway accepts incoming mail if the destination hostname of the incoming mail matches one of the aliases configured by the **mta receive aliases** command.

The MTA also controls the generation of MDN status messages.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **mta receive aliases** *string*
4. **mta receive maximum-recipients** *number*
5. **mta receive generate** [**mdn** | **permanent-error**]
6. **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	**mta receive aliases** *string* **Example:** `Router(config)# mta receive aliases fax24.ABC.com`	Defines a hostname to be used as an alias for the off-ramp gateway. Up to ten aliases can be defined. The gateway accepts incoming mail if the destination hostname of the inbound fax e-mail matches an alias. • *string* --Hostname or IP address. If specifying an IP address, enclose it in brackets as follows: [xxx.xxx.xxx.xxx]. The default is the hostname of the gateway. **Note** This command is mandatory unless you are using the gateway hostname as the e-mail hostname. For example, the router does not accept an e-mail to FAX=5550119@10.80.8.107 unless 10.80.8.107 is defined as an alias.
Step 4	**mta receive maximum-recipients** *number* **Example:** `Router(config)# mta receive maximum-recipients 48`	Defines the number of simultaneous SMTP recipients handled by this gateway. This definition is intended to limit the number of resources allocated for fax transmissions. • *number* --Number of simultaneous SMTP recipients. Range: 0 to 1024. The default is 0 recipients, which means that incoming mail messages are not accepted; therefore, no faxes are sent by the off-ramp gateway.

	Command or Action	Purpose
Step 5	**mta receive generate** [**mdn** | **permanent-error**] **Example:** `Router(config)# mta receive generate permanent-error`	Specifies the type of fax delivery response message that a T.37 fax off-ramp gateway should return. To return to the default, use the **no** form of this command. **Note** The **mta receive generate** command replaces the **mta receive generate-mdn** command in Cisco IOS Release 12.3(7)T. • When DSN messages are requested, more information is provided in the DSNs than if this command is not enabled. • The **mdn**keyword directs the T.37 off-ramp gateway to process response MDNs from an SMTP server. • The **permanent-error** keyword directs the T.37 off-ramp fax gateway to classify all fax delivery errors as permanent so that they are forwarded in DSN messages with descriptive error codes to an MTA. The default is that standard SMTP status messages are returned to the SMTP client with error classifications of permanent or transient. **Note** Messages returned to the originator of an e-mail message indicating that the e-mail message has been opened is reported through MDN. Specifications for MDN are described in RFC 2298. For more information, see the Configuring MDNs on the Off-Ramp Gateway, on page 37.
Step 6	**end** **Example:** `Router(config)# end`	Exits global configuration mode.

Configuring MDNs on the Off-Ramp Gateway

MDNs are sent to an address chosen by the sender. The following text is included in the e-mail header of the message:

```
Disposition-Notification-To:
```

This text is followed by the address of the sender as defined in the **mta send return-receipt-to** command.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **mta receive generate mdn**

4. **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	**mta receive generate mdn** **Example:** `Router(config)# mta receive generate mdn`	Instructs the off-ramp gateway to respond to and process MDN requests from the SMTP server. **Note** The **mta receive generate mdn**command replaces the **mta receive generate-mdn** command in Cisco IOS Release 12.3(7)T.
Step 4	**end** **Example:** `Router(config)# end`	Exits global configuration mode.

Configuring Security and Accounting on the Off-Ramp Gateway

This task consists of the following subtasks:

Note It is recommended that access control lists (ACLs) be configured to restrict which IP addresses can connect to the SMTP port (port 25). For information about configuring ACLs, see the Creating an IP Access List and Applying it to an Interface module in the *Cisco IOS Security Configuration Guide*. We recommend that the off-ramp gateway accept incoming SMTP connections only from trusted mailers. Configure packet filters to permit only certain trusted IP addresses to send faxes to the store-and-forward fax off-ramp gateway.

Configuring Off-Ramp Gateway Security and Accounting

Perform this task to set up authorization and billing for the off-ramp gateway.

Note Steps 10 through 13 do not apply to Cisco AS5300 gateways with modem cards.

SUMMARY STEPS

1. **enable**

2. **configure terminal**
3. **aaa new-model**
4. **aaa authentication login fax radius**
5. **aaa accounting connection fax start-stop group radius**
6. **radius-server host** *host* **auth-port** *number* **acct-port** *number*
7. **radius-server key** {**0** *string* | **7** *hidden-string*| *string*}
8. **radius-server vsa send accounting**
9. **radius-server vsa send authentication**
10. **mmoip aaa method fax authentication** *method-list-name*
11. **mmoip aaa receive-authentication enable**
12. **mmoip aaa method fax accounting** *method-list-name*
13. **mmoip aaa receive-accounting enable**
14. **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	**aaa new-model** **Example:** `Router(config)# aaa new-model`	Enables AAA security and accounting services.
Step 4	**aaa authentication login fax radius** **Example:** `Router(config)# aaa authentication login fax radius`	Defines a method list called fax in which RADIUS is defined as the only method of login authentication. **Note** The method list name (fax) should match the name used in the Configuring T.37 IVR Application Security and Accounting on the Off-Ramp Gateway, on page 42.
Step 5	**aaa accounting connection fax start-stop group radius** **Example:** `Router(config)# aaa accounting connection fax start-stop group radius`	Defines the accounting method list called fax with RADIUS as a method and with an option to send both start and stop accounting records to the AAA server. The fax method list is static and is applied by default to all voice interfaces.

	Command or Action	Purpose
		Note The method list name (fax) should match the name used in the Configuring T.37 IVR Application Security and Accounting on the Off-Ramp Gateway, on page 42.
Step 6	**radius-server host** *host* **auth-port** *number* **acct-port** *number* **Example:** `Router(config)# radius-server host accthost.ABC.com auth-port 2222 acct-port 2223`	Identifies the RADIUS server and the port that is used for authentication and accounting services. You can use multiple **radius-server host** commands to specify multiple hosts. The software searches for hosts in the order in which you specify them. • *host* --Hostname or IP address of the RADIUS server host. • *number* --Port number for authentication or accounting requests. If set to 0, the host is not used. If unspecified for authentication, the port number defaults to 1645. If unspecified for accounting, the port number defaults to 1646.
Step 7	**radius-server key** {**0** *string* | **7** *hidden-string*| *string*} **Example:** `Router(config)# radius-server key 0 3j59g3qpc`	Sets the authentication and encryption key for all RADIUS communications between the router and the RADIUS daemon on the server. • **0** --Unencrypted (clear-text) shared key follows. • **7** --Hidden shared key follows. • *hidden-string* --Hidden shared key. • *string* --Unencrypted (clear-text) shared key.
Step 8	**radius-server vsa send accounting** **Example:** `Router(config)# radius-server vsa send accounting`	Enables the network access server to recognize and use accounting vendor-specific attributes (VSAs) as defined by RADIUS Internet Engineering Task Force (IETF) attribute 26. VSAs allow vendors to support their own extended attributes not suitable for general use.
Step 9	**radius-server vsa send authentication** **Example:** `Router(config)# radius-server vsa send authentication`	Enables the network access server to recognize and use authentication VSAs as defined by RADIUS IETF attribute 26.
Step 10	**mmoip aaa method fax authentication** *method-list-name* **Example:** `Router(config)# mmoip aaa method fax authentication authen-fax`	Defines the name of the method list to be used for store-and-forward fax AAA authentication. The method list, which defines the type of authentication services provided for store-and-forward fax, is itself defined using the **aaa authentication** global configuration command. Unlike standard AAA (in which each defined method list can be applied to specific interfaces and lines), the AAA

	Command or Action	Purpose
		authentication method lists used in store-and-forward fax are applied globally on the gateway. • *method-list-name* --Character string that names a list of authentication methods to be used with store-and-forward fax.
Step 11	**mmoip aaa receive-authentication enable** **Example:** `Router(config)# mmoip aaa receive-authentication enable`	Enables AAA authentication services if an AAA authentication method list has been defined using both the **aaa authentication** command and the **mmoip aaa method fax authentication** command.
Step 12	**mmoip aaa method fax accounting** *method-list-name* **Example:** `Router(config)# mmoip aaa method fax accounting acctg-fax`	(Required) Defines the name of the method list to be used for store-and-forward fax AAA accounting. The method list, which defines the type of accounting services provided for store-and-forward fax, is itself defined using the aaa accounting global configuration command. Unlike standard AAA (in which each defined method list can be applied to specific interfaces and lines), the AAA accounting method lists used in store-and-forward fax are applied globally on the gateway. • *method-list-name* --Character string that names a list of accounting methods to be used with store-and-forward fax.
Step 13	**mmoip aaa receive-accounting enable** **Example:** `Router(config)# mmoip aaa receive-accounting enable`	Enables off-ramp AAA accounting services if an AAA accounting method list has been defined using both the **aaa accounting** command and the **mmoip aaa method fax accounting** command.
Step 14	**end** **Example:** `Router(config)# end`	Exits global configuration mode.

Creating SMTP filters with ACLs

Incoming ACLs can be used on Ethernet or Fast Ethernet interfaces to filter SMTP traffic for store-and-forward fax. It is recommended that ACLs be configured to restrict access to the SMTP port (port 25) to only trusted e-mail servers. The creation of ACLs is beyond the scope of this document.

The following example, though, provides a starting point by restricting access to the SMTP port 25 to a trusted e-mail server (IP address 10.0.0.1):

```
! Configure ACLs to restrict access to the SMTP port (port 25) to only "trusted"
! e-mail servers. Depending on the topology of your particular network, replace the
! any keyword with the destination IP addresses of the Ethernet and Fast Ethernet
! interfaces. Define all trusted e-mail servers using the tcp host ip-address
```

```
! portion of this command.
access-list 100 permit tcp host 10.0.0.1 any eq smtp
 access-list 100 deny tcp any any eq smtp
 access-list 100 permit ip any any
!
! Enter interface configuration mode for Ethernet interface 0.
interface ethernet 0
! Apply the access list to this interface.
 access-group 100 in
!
! Enter interface configuration mode for Fast Ethernet interface 0.
interface fastethernet 0
! Apply the access list to this interface.
access-group 100 in
```

Note For complete information about configuring ACLs, see the *Cisco IOS Security Configuration Guide*.

Configuring T.37 IVR Application Security and Accounting on the Off-Ramp Gateway

Perform this task to configure the specified IVR application to perform authentication and accounting tasks in conjunction with a RADIUS server. IVR uses (Tcl) scripts to gather information and to process accounting and billing. For example, a Tcl IVR script plays when a caller receives a voice-prompt instruction to enter a specific type of information, such as a personal identification number (PIN). After playing the voice prompt, the Tcl IVR application collects the predetermined number of touch tones and sends the collected information to an external server for user authentication and authorization.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **application**
4. **service** *service-name location*
5. **param accounting enable**
6. **param accounting-list** *method-list-name*
7. **param authentication enable**
8. **param authen-list** *method-list-name*
9. **param authen-method** {**prompt-user** | **ani** | **dnis** | **gateway** | **redialer-id** | **redialer-dnis**}
10. **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:**	Enters global configuration mode.

	Command or Action	Purpose
	`Router# configure terminal`	
Step 3	**application** **Example:** `Router(config)# application`	Enters application configuration mode to configure voice applications and services.
Step 4	**service** *service-name location* **Example:** `Router(config-app)# service fax_detect flash:app_fax_detect.10.1.2.2.tcl`	Loads a VoiceXML document or Tcl script and defines its application name. • *service-name* --Name that identifies the voice application. This is a user-defined name and does not have to match the script name. • *location* --Directory and filename of the Tcl script or VoiceXML document in URL format. For example, Flash memory (flash:filename), a TFTP (tftp://../filename), or an HTTP server (http://../filename) are valid locations.
Step 5	**param accounting enable** **Example:** `Router(config-app)# param accounting enable`	Enables AAA accounting for a Tcl application.
Step 6	**param accounting-list** *method-list-name* **Example:** `Router(config-app)# param accounting-list fax`	Defines the name of the accounting method list to be used for AAA with store-and-forward fax on a voice feature card (VFC). • *method-list-name* --Character string used to name a list of accounting methods to be used with store-and-forward fax. **Note** The method list name should match the name used in the Configuring Security and Accounting on the Off-Ramp Gateway, on page 38.
Step 7	**param authentication enable** **Example:** `Router(config-app)# param authentication enable`	Enables AAA authentication for a Tcl application.
Step 8	**param authen-list** *method-list-name* **Example:** `Router(config-app)# param authen-list fax`	Specifies the name of an authentication method list for a Tcl application. • *method-list-name* --Character string used to name a list of authentication methods to be used with store-and-forward fax.

	Command or Action	Purpose
		Note The method list name should match the name used in the Configuring Security and Accounting on the Off-Ramp Gateway, on page 38.
Step 9	**param authen-method** {**prompt-user** | **ani** | **dnis** | **gateway** | **redialer-id** | **redialer-dnis**} **Example:** `Router(config-app)# param authen-method ani`	Specifies the type of authentication method for the named application. • **prompt-user** --The user is prompted for the Tcl application account identifier. • **ani** --The calling-party telephone number (automatic number identification [ANI]) is used as the Tcl application account identifier. • **dnis** --The called party telephone number (dialed number identification service [DNIS]) is used as the Tcl application account identifier. • **gateway** --The router-specific name derived from the hostname and domain name is used as the Tcl application account identifier. It is displayed in the following format: router-name.domain-name. • **redialer-id** --The account string returned by the external redialer device is used as the Tcl application account identifier. In this case, the redialer ID is either the redialer serial number or the redialer account number. • **redialer-dnis** --The called party telephone number (DNIS) is used as the Tcl application account identifier captured by the redialer if a redialer device is present.
Step 10	**end** **Example:** `Router(config-app)# end`	Exits application configuration mode.

Troubleshooting Tips

Use the following show commands to troubleshoot store-and-forward fax on both the on-ramp and off-ramp gateways.

- **show dial-peer voice** [*tag*] [**summary**]--Displays configuration information for MMoIP and POTS dial peers so that you can verify that store-and-forward fax is enabled.
- **show call application voice summary** --Lists all voice applications that are loaded on the router so that you can confirm that the scripts that you are interested in are loaded.

- **show call application voice** *application-name* --Displays the line-by-line contents of the Tcl script associated with the specified application.
- **show accounting** --No specific **show** command exists for either RADIUS or TACACS+ accounting. To obtain accounting records that display information about users currently logged in, use the **show accounting** command.

Configuration Examples for T.37 Store-and-Forward Fax

Example On-Ramp Gateway

The following example is sample configuration of a T.37 on-ramp gateway:

```
! Define the called subscriber number. In this case, the number configured as the
! destination pattern will be used as the called subscriber identifier.
fax receive called-subscriber $d$
!
! Specify the originator of the e-mail address. In this case, the originator information
! is derived from the calling number.
mta send mail-from username $s$
!
! (Optional) Provide additional information about the sending device. In this example,
! the sending device's hostname is alabama
mta send origin-prefix alabama
!
! Define where this fax-mail should be delivered (which is the mail server postmaster
! account) if it cannot be delivered to the defined destination.
mta send postmaster postmaster@company.com
!
! (Optional) If configuring MDNs, specify the address to which they should be
! sent.
mta send return-receipt-to username postmaster@company.com
!
! Specify the destination e-mail server that accepts on-ramp fax mail.
mta send server california.fax.com
!
! Define the text string that will be displayed as the subject of the fax mail.
mta send subject Fax-Mail Message
!
! Enter dial-peer configuration mode and define an on-ramp POTS peer.
dial-peer voice 1000 pots
!
! Designate fax as the type of information handled by this dial peer.
 information-type fax
!
! Specify direct inward dial for this dial peer.
 direct-inward-dial
!
! Define the incoming called number associated with this dial peer.
 incoming called number 5105550119
!
! (Optional) Define the maximum number of connections that will be used simultaneously
! to transmit fax mail.
 max-conn 10
!
! Define an on-ramp MMoIP dial peer.
dial-peer voice 1001 mmoip
!
! Define the telephone number associated with this dial peer.
```

```
 destination-pattern 14085550119
!
! Define a destination e-mail address for this dial peer.
 session-target mailto:$d$@abccompany.com
!
! (Optional) Request that DSNs be sent.
 dsn failure
!
! Specify a particular image encoding method to be used for fax images. In this
! example, Modified Huffman (IETF standard) is being specified.
 image encoding mh
!
!Specify a particular fax image resolution. In this example, the image resolution was
!set to 204 by 196 pixels per inch (fine).
 image resolution fine
!
!Designate fax as the type of information handled by this dial peer.
 info-type fax
!
!(Optional) Define the maximum number of connections that will be used simultaneously
!to transmit fax mail.
 max-conn 10
!
!(Optional) Request that MDNs be sent.
 mdn
!
! Specify SMTP as the protocol to be used for store-and-forward fax.
 session protocol smtp
```

Example Off-Ramp Gateway

The following is sample configuration of a T.37 off-ramp gateway:

```
.
.
! Define the transmitting subscriber number (TSI); this is the number that is
! displayed in the LCD of the receiving fax machine. In this example, the sender's
! name (captured by the on-ramp from the sending fax machine) will be used.
fax send transmitting-subscriber $s$
!
! Configure the speed of the fax transmission. In this case, fax transmissions will be
! sent at 14400 bits per second.
fax send max-speed 14400
!
! Define a hostname to be used as an alias for the off-ramp Cisco AS5300 device.
mta receive aliases abccompany.com
!
! (Optional) Specify that the Cisco AS5300 universal access server will respond to an MDN
! request.
mta receive generate mdn
!
! Define the number of simultaneous SMTP recipients (in this case, 10) handled by this
! Cisco AS5300 device.
mta receive maximum-recipients 10
!
!
! Specify that the company name will appear in the center position of the fax
! header information.
fax send center-header Acme Company
!
! Specify that the page count will appear in the right position of the fax header
! information.
fax send right-header $p$
```

```
!
! Specify that the date will appear in the left position of the fax header
! information.
fax send left-header $a$
!
! Enable the Cisco AS5300 device to send a cover sheet with faxes that originate from
! e-mail messages.
fax send coverpage enable
!
! Add a personalized comment to the title field of the fax cover sheet. In this case,
! the phrase FAX TRANSMISSION was added.
fax send coverpage comment FAX TRANSMISSION
!
! Enter dial-peer configuration mode and define an off-ramp POTS dial peer.
dial-peer voice 1002 pots
!
! Designate fax as the type of information handled by this dial peer.
 information-type fax
!
! Define a telephone number to be associated with this dial peer.
 destination-pattern 1408555....
!
! Add prefix.
 prefix 9,555
!
! Define an off-ramp MMoIP peer.
dial-peer voice 1003 mmoip
!
! Designate fax as the type of information handled by this dial peer.
 information-type fax
!
! Define an incoming called number to be associated with this dial peer.
 incoming called-number 14085550020
!
! Specify a particular fax image resolution. In this example, the image resolution was
! set to 204 by 196 pixels per inch (fine).
 image resolution fine
!
```

Example Combined On-Ramp and Off-Ramp Gateway

The following is sample T.37 store-and-forward fax configuration for a single gateway that performs both on-ramp and off-ramp gateway functions:

```
fax interface-type fax-mail
!
service timestamps debug uptime
service timestamps log uptime
!
hostname fax-gateway
!
enable password lab
!
username betatest password 0 password
!
ip subnet-zero
ip host mars 192.168.254.254
ip host saturn 172.28.129.150
ip domain-name abcwrecking.com
ip name-server 10.14.116.1
!
! Used for fallback from T.38 fax relay to T.37 fax.
voice hunt user-busy
```

```
!
!
! Global service for fax relay.
voice service voip
 fax protocol t38 ls_redundancy 0 hs_redundancy 0
!
application
 service app_offramp tftp://mars/libretto-test/app_offramp5.tcl
  param authen-list fax
  param authen-method gateway
  param accounting-list fax
!
application
 service app_onramp tftp://mars/smith/faxdir/onramp13.nc.tcl
  param authen-list fax
  param authen-method gateway
  param language 1 en
  param accounting-list fax
application
 service app_onramp set-location en 0 tftp://mars/smith/WV/en_new/
!
fax receive called-subscriber $d$
fax send transmitting-subscriber $s$
fax send left-header $s$
fax send center-header $t$
fax send right-header Page: $p$
fax send coverpage enable
fax send coverpage email-controllable
fax send coverpage comment ABC Wrecking cover page
mta receive aliases [10.14.120.2]
mta send server saturn_smtp_server
mta send subject "Facsimile Transmission"
mta send origin-prefix ABCWrecking Fax
mta send postmaster postmaster postmaster@abcwrecking.com
mta send mail-from hostname saturn
mta send mail-from username fax-user
mta send return-receipt-to hostname return.host.com
mta send return-receipt-to username $s$
mta receive aliases bock.abcwrecking.com
mta receive aliases abcwrecking.com
mta receive maximum-recipients 200
mta receive generate mdn
!
!
controller T1 1/1
 framing esf
 clock source line primary
 linecode b8zs
 ds0-group 0 timeslots 1-24 type e&m-fgd
!
interface Ethernet0
 ip address 10.14.120.2 255.255.0.0
 no ip directed-broadcast
!
interface FastEthernet0
 no ip address
 no ip directed-broadcast
 shutdown
 duplex auto
 speed auto
!
ip default-gateway 10.14.0.1
ip classless
ip route 192.168.254.0 255.255.255.0 10.14.0.1
```

```
no ip http server
!
!
voice-port 1/1:0
!
!
! Inbound peer for T.37 on-ramp operation.
dial-peer voice 2 pots
 application app_onramp
 incoming called-number 5......
 direct-inward-dial
 port 1/1:0
!
! Outbound peer for T.37 on-ramp operation.
dial-peer voice 3 mmoip
! The application named below must be exactly as shown!
 service fax_on_vfc_onramp_app out-bound
 destination-pattern 57108..
 session target mailto:$d$@mail-server.abcwrecking.com
! MDN and DSN configuration can be set in this peer.
!
! Inbound peer for T.37 off-ramp operation.
dial-peer voice 21 mmoip
 application app_offramp
 incoming called-number 5......
 information-type fax
!
! Outbound peer for T.37 off-ramp operation.
dial-peer voice 20 pots
 destination-pattern 5......
 port 1/1:0
 prefix 5
```

Example Combined On-Ramp and Off-Ramp Gateway with Security

The following is sample configuration for a combined on-ramp and off-ramp gateway enabled for security:

```
!
! Enable AAA security services.
aaa new-model
! Define the method list to be used with store-and-forward fax authentication.
mmoip aaa method fax authentication onramp-auth
! Define the method list to be used with store-and-forward fax accounting services.
mmoip aaa method fax accounting onramp-acct
! Define and enable the AAA authentication method list for store-and-forward fax.
aaa authentication login onramp-auth radius local
! Define and enable the AAA accounting method list for store-and-forward fax.
aaa accounting connection onramp-acct stop-only radius
! Enable on-ramp authentication.
mmoip aaa receive-authentication enable
! Enable on-ramp accounting services.
mmoip aaa receive-accounting enable
! Enable off-ramp authorization.
mmoip aaa send-authentication enable.
! Enable off-ramp accounting services.
mmoip aaa receive-accounting enable
! Define the gateway ID as the means by which AAA identifies the user for
! off-ramp authentication.
mmoip aaa send-id primary gateway
! Define the gateway ID as the means by which AAA identifies the user for on-ramp
! authentication.
mmoip aaa receive-id primary gateway
! Configure the Cisco AS5300 device to support RADIUS.
```

```
radius-server host 172.18.11.13 auth-port 1645 acct-port 1646
radius-server key password
! Configure the RADIUS server to recognize and use vendor-specific attributes.
radius-server vsa send accounting
radius-server vsa send authentication
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
Cisco IOS Voice commands : complete command syntax, command mode, command history, defaults, usage guidelines, and examples	*Cisco IOS Voice Command Reference*
Configuring ACL	Creating an IP Access List and Applying it to an Interface module in the Cisco IOS Security Configuration Guide

Standards

Standard	Title
None	--

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
None	--

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Configuring T.37 Store-and-Forward Fax

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 2: Feature Information for Configuring T.37 Store-and-Forward Fax

Feature Name	Releases	Feature Information
Extended Simple Mail Transfer Protocol (ESMTP) Accounting in Store-and-Forward Fax	12.2	The SMTP facilitates the store-and-forward fax functionality, along with an additional functionality that provides confirmation of delivery using existing SMTP mechanisms, such as ESMTP.
T.37 Store-and-Forward Fax	12.0(7)T 12.1(5)T) 12.2(8)T 12.2(15)T 12.2(2)XB 12.3(14)T	Fax pass-through is a method for sending faxes over IP networks. The following command was modified: **service fax_on_vfc_onramp_app out-bound**.