



# Implementing Fax over IP on Cisco Voice Gateways

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Fax over IP enables interoperability of traditional analog fax machines with IP telephony networks. The fax image is converted from an analog signal and is carried as digital data over the packet network.

This section contains the following topics:

- [Overview, page 9-2](#)
- [Supported Platforms and Features, page 9-4](#)



## Note

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For detailed Fax information, configuration, best practices and troubleshooting tips, see *Implementing Fax Over IP on Cisco Voice Gateways* at the following location:

[http://www.cisco.com/univercd/cc/td/doc/product/voice/c\\_access/fxmdmnt.htm](http://www.cisco.com/univercd/cc/td/doc/product/voice/c_access/fxmdmnt.htm)

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# Overview

In its original form, fax data is digital. However, to transmit across a traditional PSTN, it is modulated and converted to analog. Fax over IP reverses this analog conversion, transmitting digital data over the packet network, and then reconverts the digital data to analog for the receiving fax machine.

Most Cisco voice gateways currently support two methods to transmit fax traffic across the IP network:

- **Fax Pass-Through**—In fax pass-through mode, the gateways do not distinguish a fax call from a voice call.
- **Cisco Fax Relay**—In fax relay mode, the gateways terminate the T.30 fax signaling.

Fax relay mode is the preferred method to transmit fax traffic. However, if a specific gateway does not support Cisco fax relay, the gateway supports fax pass-through.

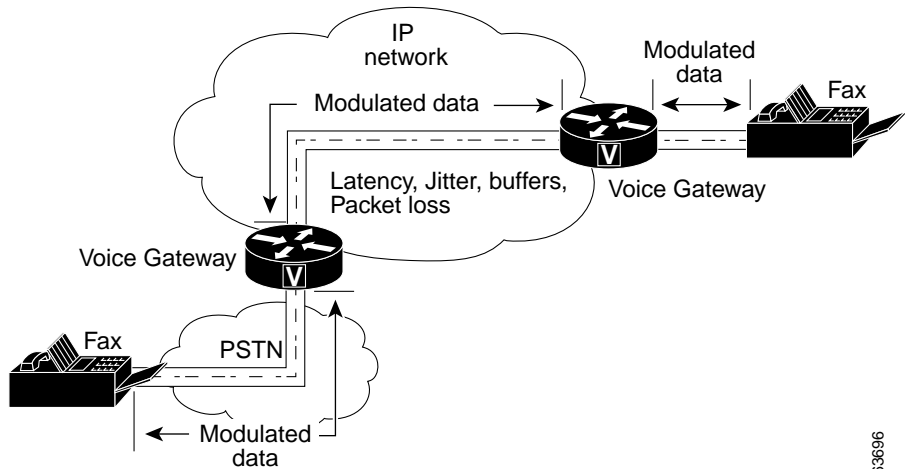
## Fax Pass-Through

In fax pass-through mode, the gateways do not distinguish a fax call from a voice call. The fax communication between the two fax machines is carried in-band over a “voice” call in its entirety. All Cisco voice gateways support fax pass-through.

On Cisco voice gateways, you can achieve more reliable fax transmissions using fax pass-through mode if you disable VAD on the gateway dial peers.

**Figure 9-1** illustrates how fax pass-through works. The fax traffic is transparently carried across the quality of service (QoS)-enabled IP infrastructure, and the data is not demodulated within the IP network.

Figure 9-1 Fax Pass-Through



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## Cisco Fax Relay

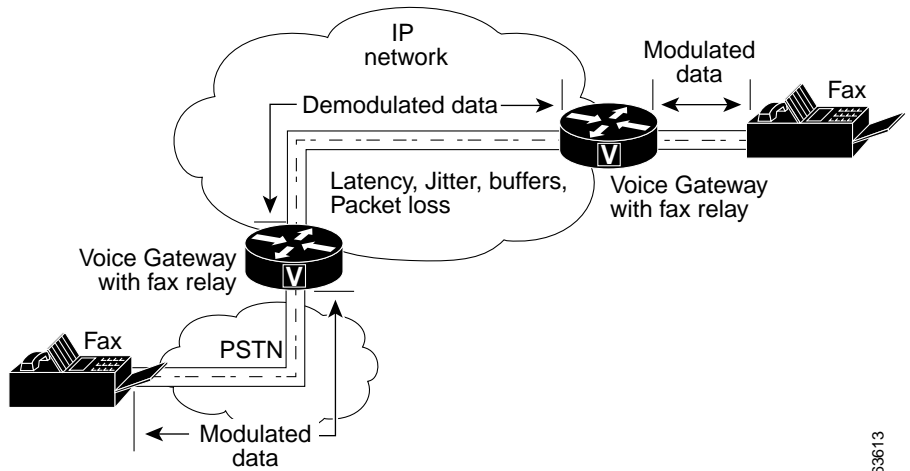
Cisco fax relay does not involve Cisco CallManager; it is a gateway-controlled fax mode. Most of the fax processing occurs in the digital signal processors (DSP), requiring only packet switching from the main processor (CPU) and some limited signaling to switch to fax mode. Therefore, the CPU overhead is very similar to a normal voice call.

Initially, a voice call is established. Once the V.21 preamble is detected at the terminating gateway, the originating and the terminating gateway negotiate the codec type. If the two sides cannot negotiate on a common codec and speed, the fax fails. If negotiation is successful, fax transmission begins.

Cisco fax relay is supported using MGCP or H.323, depending on the specific gateway type. The Cisco voice gateways support as many concurrent fax calls as G.711 voice calls.

As illustrated in [Figure 9-2](#), the voice gateway demodulates the fax data before crossing the IP network. The voice gateway at the other end of the IP network demodulates it for transfer across the PSTN.

Figure 9-2 Cisco Fax Relay



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## Supported Platforms and Features

Table 9-1 shows the supported fax protocol, modes, and required software version for the Catalyst 4224 Access Gateway Switch. You can obtain the latest versions of Cisco software from the Cisco software downloads site:

<http://www.cisco.com/kobayashi/sw-center/index.shtml>

Table 9-1 Fax Support on Cisco Catalyst 4224 Access Gateway Switch

Platform	Protocol	Transport Mode	Minimum Software Version
Catalyst 4224	H.323	Pass-through	12.1.5YE2
		Relay	12.1.5YE2