Fax Support

The Cisco Unified Border Element (SP Edition) media components enable fax over IP calls. Cisco Unified Border Element (SP Edition) supports the following types of fax over IP calls, using Session Initiation Protocol (SIP) or H.323:

- G.711 passthrough
- T.38 fax passthrough over the following protocols:
  - RTP: Real-time Transport Protocol
  - UDP-TL: A lightweight transport protocol for fax media that runs over User Datagram Protocol

Cisco Unified Border Element (SP Edition) was formerly known as Integrated Session Border Controller and may be commonly referred to in this document as the session border controller (SBC).

Feature History for Fax Support

Release	Modification
Cisco IOS XE Release 2.4	This feature was introduced on the Cisco IOS XR, along with support for the unified model.
Cisco IOS XE Release 2.5	The following were added in this release: • Support for H.323 • G.711 passthrough support for SIP and H.323 interworking calls • T.38 fax support for H.323 to H.323 and SIP to H.323 interworking calls. • Fax Upspeed support.

Contents

This module contains the following sections:

Restrictions for Fax Support

The following are restrictions for fax support in Cisco Unified Border Element (SP Edition):

- G.711 and T.38 interworking is not supported.
- T.38 fax passthrough does not support H.323 to SIP calls, or SIP to H.323 to SIP calls.
- Cisco proprietary fax is not supported, although it may work in the passthrough mode, because the Cisco Unified Border Element (SP Edition) does not police the RTP payload types, only the bandwidth. Cisco proprietary fax uses RTP.

Fax Support

Cisco Unified Border Element (SP Edition) supports two types of fax over IP:

- G.711 passthrough
- T.38 passthrough

G.711 Passthrough

G.711 passthrough is an International Telecommunication Union (ITU) standard codec operating at a 64 Kbps rate. It is a simple fax method and supports sending fax in the RTP stream of a typical G.711 call. G.711 is used by most VoIP providers because it provides high voice quality. It produces voice sounds similar to a regular or ISDN phone because G.711 does not use compression and uses the same codec used by the public switched telephone network (PSTN) and Integrated Services Digital Network (ISDN). Without the demand on processing power required by compression, G.711 has the lowest latency or lag.

Passthrough is a method of passing a FAX PCM stream across a VoIP network. It involves selecting a low-bandwidth codec (G.711), disabling silence suppression, and enabling echo cancellation. FAX passthrough is signalled by protocol stacks H.323 and SIP.

G.711 passthrough is supported for all cases of SIP and H.323 interworking calls in Cisco IOS XE Release 2.5 and later.

Note The Cisco Unified Border Element (SP Edition)'s billing records for the call do not show anything explicitly because of the fax nature of the call. They merely report the standard set of metrics for the call, as they would do for a voice call.

T.38 Passthrough

T.38 Passthrough is an ITU standard for sending FAX across IP networks in a real-time mode. In Cisco Unified Border Element (SP Edition), T.38 fax calls are sent in-band using a fax-specific codec (rather than a general-purpose audio codec). T.38 fax uses a separately negotiated stream, which can either be negotiated at the start of the call (bandwidth will be reserved for it at that point), or renegotiated during the call (which may fail).

Passthrough is a method of passing a FAX PCM stream across a VoIP network. It involves selecting a high-bandwidth codec, disabling silence suppression, and enabling echo cancellation. FAX passthrough is signalled by protocol stacks H.323 and SIP.

T.38 fax passthrough is supported for SIPto SIP calls in Cisco IOS XE Release 2.4 and later. Support for SIP to H.323 and H.323 to H.323 calls is added in Cisco IOS XE Release 2.5 and later. In the case of SIP to H.323 calls, only the SIP side of the call will initiate the T.38 passthrough.

T.38 fax passthrough does not support H.323 to SIP calls or SIP to H.323 to SIP calls.

Note The bandwidth reserved for a T.38 call is considered sufficient for carrying a T.38 rate of 14, 400 bits per second and does not reflect the signaled rate in T.38.

Note If an unnumbered datagram protocol transport layer (UDPTL) error correction is used for T.38, then the bandwidth reservation also includes capacity for up to three redundant parity packets in the T.38 stream.

Fax Upspeed Support

Cisco Unified Border Element (SP Edition) supports fax upspeed. Fax upspeed is the ability of the SBC to change a codec in midcall by re-negotiation. The fax upspeed function is only supported when one of the endpoints engaged in the call initiates it; the SBC does not initiate the upspeed action. The SBC is capable of handling midcall codec re-negotiations to and from either H.323 or SIP interfaces.

When an endpoint has determined that the call is a fax or data call and calculates that the codec negotiated is too highly compressed to reliably pass tones, it may initiate a re-Invite to perform a codec re-negotiation that offers the G.711 codec, a higher bandwidth codec. Thus the process of re-negotiating to a higher bandwidth codec is called “fax upspeed.” The G.711 codec is also known as PCMA/PCMU.

When the endpoint determines that the fax or data call has ended, then the endpoint can send another Invite re-negotiation to switch back to a lower bandwidth codec.

The same mechanism applies to H.323 call legs, where there is a terminal capability exchange (TCS) and media channels are closed and new ones reopened.