



# Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls

The Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls feature provides dynamic payload type interworking for dual tone multifrequency (DTMF) and codec packets for Session Initiation Protocol (SIP) to SIP calls.

Based on this feature, the Cisco Unified Border Element (Cisco UBE) interworks between different dynamic payload type values across the call legs for the same codec. Also, Cisco UBE supports any payload type value for audio, video, named signaling events (NSEs), and named telephone events (NTEs) in the dynamic payload type range 96 to 127.

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## Feature Information for Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls

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 <https://cfng.cisco.com/>. An account on Cisco.com is not required.

Table 1: Feature Information for Dynamic Payload Interworking for DTMF and Codec Packets Support

Feature Name	Releases	Feature Information
Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls	15.0(1)XA 15.1(1)T	The Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls feature provides dynamic payload type interworking for DTMF and codec packets for SIP-to-SIP calls.  The following commands were introduced or modified: <b>asymmetric payload</b> and <b>voice-class sip asymmetric payload</b> .
Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls	Cisco IOS Release XE 3.1S	The Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls feature provides dynamic payload type interworking for DTMF and codec packets for SIP-to-SIP calls.  The following commands were introduced or modified: <b>asymmetric payload</b> and <b>voice-class sip asymmetric payload</b> .

## Restrictions for Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls

The Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls feature is not supported for the following:

- H323-to-H323 and H323-to-SIP calls.
- All transcoded calls.
- Secure Real-Time Protocol (SRTP) pass-through calls.
- Flow-around calls.
- Asymmetric payload types are not supported on early-offer (EO) call legs in a delayed-offer to early-offer (DO-EO) scenario.
- Cisco fax relay.
- Multiple  $m$  lines with the same dynamic payload types, where  $m$  is:

$m = \text{audio } \langle \text{media-port1} \rangle \text{ RTP/AVP XXX } m = \text{video } \langle \text{media-port2} \rangle \text{ RTP/AVP XXX}$

## Symmetric and Asymmetric Calls

Cisco UBE supports dynamic payload type negotiation and interworking for all symmetric and asymmetric payload type combinations. A call leg on Cisco UBE is considered as symmetric or asymmetric based on the payload type value exchanged during the offer and answer with the endpoint:

- A symmetric endpoint accepts and sends the same payload type.
- An asymmetric endpoint can accept and send different payload types.

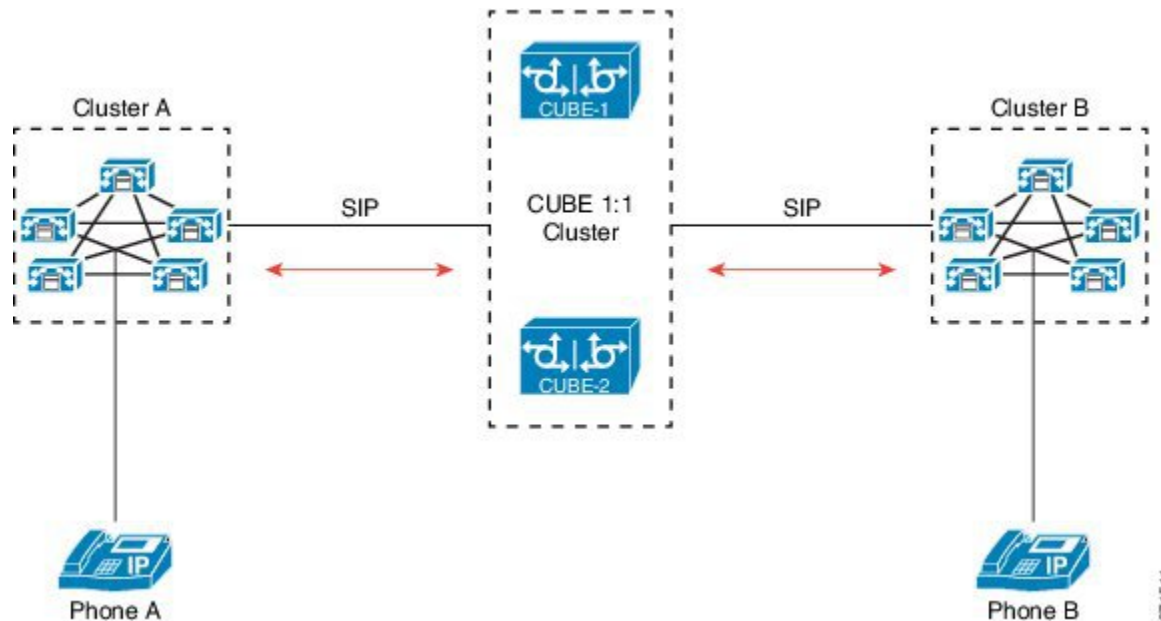
The Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls feature is enabled by default for a symmetric call. An offer is sent with a payload type based on the dial-peer configuration. The answer is sent with the same payload type as was received in the incoming offer. When the payload type values negotiated during the signaling are different, the Cisco UBE changes the Real-Time Transport Protocol (RTP) payload value in the VoIP to RTP media path.

To support asymmetric call legs, you must enable The Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls feature. The dynamic payload type value is passed across the call legs, and the RTP payload type interworking is not required. The RTP payload type handling is dependent on the endpoint receiving them.

## High Availability Checkpointing Support for Asymmetric Payload

High availability for a call involving asymmetric payloads is supported. In case of fail-over from active to stand-by, the asymmetric payload interworking will be continued as new active CUBE passes across the payload type values according to the negotiation and call establishment.

**Figure 1: Sample High-Availability Topology**



# How to Configure Dynamic Payload Type Passthrough for DTMF and Codec Packets for SIP-to-SIP Calls

## Configuring Dynamic Payload Type Passthrough at the Global Level

Perform this task to configure the pass through of DTMF or codec payload to the other call leg (instead of performing dynamic payload type interworking) feature at the global level.

### SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `voice service voip`
4. `sip`
5. `asymmetric payload {dtmf | dynamic-codecs | full | system}`
6. `end`

### DETAILED STEPS

#### Procedure

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Device> enable <b>Example:</b>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
Step 3	<b>voice service voip</b> <b>Example:</b> Device(config)# voice service voip	Enters voice service configuration mode.
Step 4	<b>sip</b> <b>Example:</b> Device(conf-voi-serv)# sip	Enters voice service SIP configuration mode.

	Command or Action	Purpose
<b>Step 5</b>	<b>asymmetric payload</b> {dtmf   dynamic-codecs   full   system} <b>Example:</b> <pre>Device(conf-serv-sip)# asymmetric payload full</pre>	Configures global SIP asymmetric payload support. <b>Note</b> The <b>dtmf</b> and <b>dynamic-codecs</b> keywords are internally mapped to the <b>full</b> keyword to provide asymmetric payload type support for audio and video codecs, DTMF, and NSEs.
<b>Step 6</b>	<b>end</b> <b>Example:</b> <pre>Device(conf-serv-sip)# end</pre>	Exits voice service SIP configuration mode and enters privileged EXEC mode.

## Configuring Dynamic Payload Type Passthrough for a Dial Peer

Perform this task to configure the pass through of DTMF or codec payload to the other call leg (instead of performing dynamic payload type interworking) feature at the dial-peer level.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **dial-peer voice tag voip**
4. **voice-class sip asymmetric payload** {dtmf | dynamic-codecs | full | system}
5. **end**

### DETAILED STEPS

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> <pre>Device&gt; enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> <pre>Device# configure terminal</pre>	Enters global configuration mode.
<b>Step 3</b>	<b>dial-peer voice tag voip</b> <b>Example:</b> <pre>Device(config)# dial-peer voice 77 voip</pre>	Enters dial peer voice configuration mode.

	Command or Action	Purpose
<b>Step 4</b>	<b>voice-class sip asymmetric payload {dtmf   dynamic-codecs   full   system}</b> <b>Example:</b> <pre>Device(config-dial-peer)# voice-class sip asymmetric payload full</pre>	Configures the dynamic SIP asymmetric payload support. <b>Note</b> The <b>dtmf</b> and <b>dynamic-codecs</b> keywords are internally mapped to the <b>full</b> keyword to provide asymmetric payload type support for audio and video codecs, DTMF, and NSEs.
<b>Step 5</b>	<b>end</b> <b>Example:</b> <pre>Device(config-dial-peer)# end</pre>	(Optional) Exits dial peer voice configuration mode and enters privileged EXEC mode.

## Verifying Dynamic Payload Interworking for DTMF and Codec Packets Support

This task shows how to display information to verify Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls configuration feature. These **show** commands need not be entered in any specific order.

### SUMMARY STEPS

1. **enable**
2. **show call active voice compact**
3. **show call active voice**

### DETAILED STEPS

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> <pre>Device&gt; enable</pre>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>show call active voice compact</b> <b>Example:</b> <pre>Device# show call active voice compact</pre>	(Optional) Displays a compact version of call information.
<b>Step 3</b>	<b>show call active voice</b> <b>Example:</b> <pre>Device# show call active voice</pre>	(Optional) Displays call information for voice calls in progress.

## Troubleshooting Tips

Use the following commands to debug any errors that you may encounter when you configure the Dynamic Payload Type Interworking for DTMF and Codec Packets for SIP-to-SIP Calls feature:

- **debug ccsip all**
- **debug voip ccapi inout**
- **debug voip rtp**

Use the following debug commands to troubleshoot HA Checkpointing for Asymmetric Payload:

- **debug voip ccapi all**
- **debug voice high-availability all**
- **debug voip rtp error**
- **debug voip rtp inout**
- **debug voip rtp packet**
- **debug voip rtp high-availability**
- **debug voip rtp function**
- **debug ccsip all**

Use the following **show** commands to troubleshoot HA Checkpointing for Asymmetric Payload:

- **show redundancy state**
- **show redundancy inter-device**
- **show standby brief**
- **show voice high-availability summary**
- **show voip rtp stats**
- **show voip rtp high-availability stats**
- **show voip rtp connection detail**
- **show call active voice brief**
- **show call active voice [summary]**
- **show call active video brief**
- **show call active video [summary]**
- **show align**
- **show memory debug leak**

## Configuration Examples for Assymmetric Payload Interworking

### Example: Asymmetric Payload Interworking—Passthrough Configuration

```
!  
voice service voip  
  allow-connections sip to sip  
sip  
  rel1xx disable  
  asymmetric payload full  
  midcall-signaling passthru
```

**Example: Asymmetric Payload Interworking—Interworking Configuration**

```
!  
dial-peer voice 1 voip  
  voice-class sip asymmetric payload full  
  session protocol sipv2  
  rtp payload-type cisco-codec-fax-ind 110  
  rtp payload-type cisco-codec-video-h264 112  
  session target ipv4:9.13.8.23  
!
```

In the above example, it is assumed that 110 and 112 are not used for any other payload.

**Example: Asymmetric Payload Interworking—Interworking Configuration**

```
!  
voice service voip  
  allow-connections sip to sip  
!  
dial-peer voice 1 voip  
  session protocol sipv2  
  rtp payload-type cisco-codec-fax-ind 110  
  rtp payload-type cisco-codec-video-h264 112  
  session target ipv4:9.13.8.23  
!
```

In the above example, it is assumed that 110 and 112 are not used for any other payload.