CHAPTER 3

DTMF Interworking on the Cisco Unified Border Element (SP Edition) Distributed Model

This chapter describes the importance and function of dual-tone multifrequency (DTMF) interworking between various signaling types and how DTMF is supported on Cisco Unified Border Element (SP Edition).

For a complete description of the commands used in this chapter, see *Cisco Unified Border Element (SP Edition) Command Reference: Distributed Model* at:

http://www.cisco.com/en/US/docs/ios/sbc/command/reference/sbc_book.html

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Information About DTMF Interworking

One of the features of Cisco Unified Border Element (SP Edition) is the ability to interwork between the various dual-tone multifrequency (DTMF) signaling types. DTMF interworking is used when the two endpoints do not use the same type for relaying DTMF tones.

DTMF dialing consists of simultaneous voice-band tones generated when a button is pressed on a telephone. The challenge comes from a scenario where one side uses Real-time Transport Protocol (RTP) and the other uses Session Initiation Protocol (SIP) signaling to enable advanced telephony services. Examples of the types of services and platforms that are supported by DTMF interworking are various voice web browser services, Centrex switches or business service platforms, calling card services, and unified message servers. All of these applications require DTMF interworking for the user to communicate with the application outside of the media connection.

The Cisco ASR 1000 Series Aggregation Services Routers only support DTMF interworking between RTP and SIP DTMF indication types. This type of DTMF interworking provides for DTMF signals generated by SIP to be inserted into an RTP stream and RTP DTMF tones to be extracted and to generate a SIP message.

The following are ways of generating a DTMF tone:

- SIP digit detection and generation package—A SIP message is sent from the endpoint to the SIP proxy indicating that there has been a DTMF event, the type and the duration of the event.
- RTP DTMF insertion—The RTP packets contain information in their headers indicating that a DTMF is being generated. The endpoints interpret these messages and play the DTMF locally.
- In-band waveform—The DTMF is sent as part of the voice waveform.

RTP-to-SIP Interworking

In the case where the RTP packet is marked as DTMF, the RTP packet is removed from the stream and the DBE sends an H.248 message to the SBE indicating that a DTMF event has occurred and that this should be converted into a SIP DTMF event.

SIP-to-RTP Interworking

In the case of an endpoint generating a SIP signal, the SIP DTMF signals arrive completely out of band. An endpoint that supports SIP DTMF generates the signals to the SBE. The SBE recognizes that this is a DTMF message and sends an H.248 message to the DBE that a DTMF tone is required to be inserted into the RTP stream. The DBE then inserts the RTP DTMF packets into the audio stream.

Configuring the Default Duration of a DTMF Event

For a complete description of commands used in this chapter, see *Cisco Unified Border Element (SP Edition) Command Reference: Distributed Model* at:

http://www.cisco.com/en/US/docs/ios/sbc/command/reference/sbc_book.html.

Use the **dtmf-duration** command in VDBE configuration mode to configure a default duration of a DTMF event. If there is no DTMF duration configured, the system default is 200 milliseconds.

Prerequisites

Before implementing interworking DTMF, the DBE must be created.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **sbc** {*sbc-name*} **dbe**
4. **vdbe** [**global**]
5. **dtmf-duration** {*duration*}
6. **exit**
7. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables the privileged EXEC mode. Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters the global configuration mode.
Step 3	**sbc** {*sbc-name*} **dbe** **Example:** `Router(config)# sbc global dbe`	Enters the mode of a DBE service and enters into SBC-DBE configuration mode. Use the *sbc-name* argument to specify the name of the DBE service.
Step 4	**vdbe** [**global**] **Example:** `Router(config-sbc-dbe)# vdbe global`	Enters into the VDBE configuration mode with a default DBE named “global”. Only one DBE is supported and its name must be “global”.
Step 5	**dtmf-duration** {*duration*} **Example:** `Router(config-sbc-dbe-vdbe)# dtmf-duration 250`	Configures the default duration of a DTMF event in milliseconds.
Step 6	**exit** **Example:** `Router(config-sbc-dbe-vdbe)# exit`	Exits the VDBE configuration mode.
Step 7	**end** **Example:** `Router(config-sbc-dbe)# end`	Exits SBC-DBE configuration mode and returns to the privileged EXEC mode.