



Implementing SBC Transcoding

Transcoding is the process of translating a media stream encoded using one codec into a media stream encoded using another codec. For example, translating a media stream encoded as Pulse Code Modulation u-law (PCMU) into one encoded as G.726-32.

The primary reason for transcoding configurations is to configure the capabilities of external media transcoding devices when these devices cannot be discovered automatically. In-band auto-discovery of transcoder capabilities is currently not supported. Therefore, this step must be done when configuring all connections to all current remote transcoding devices.



Note

Transcoding configurations can be skipped altogether if the described reason does not apply.

Media gateways are allowed to connect whether or not configuration has been supplied for them. To help avoid configuration errors, the (signaling border element) SBE logs a warning if an incoming connection is received from a media gateway that is not a (data border element) DBE and does not have transcoding configured.



Note

For a complete description of commands used in this chapter, refer to the *Cisco IOS XR Session Border Controller Command Reference*. To locate documentation for other commands that appear in this chapter, use the command reference master index, or search online.

Feature History for Implementing SBC Transcoding

Release	Modification
Release 3.3.0	This feature was introduced on the Cisco XR 12000 Series Router.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.5.1	No modification.
Release 3.6.0	No modification.

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Prerequisites for Implementing Transcoding

The following prerequisites are required to implement SBC transcoding:

- You must be in a user group associated with a task group that includes the proper task IDs for SBC commands being used. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.
- You must install and activate the package installation envelope (PIE) for the SBC software.
For detailed information about PIE installation, refer to the *Upgrading and Managing Cisco IOS XR Software* module in the *Cisco IOS XR Getting Started Guide*.
- All SBE and DBE configurations required to make simple calls must already be configured. Transcoding configurations follow these configurations.

Information About Transcoding

Transcoding is the process of translating a media stream encoded using one codec into a media stream encoded using another codec. For example, translating a media stream encoded as PCMU into one encoded as G.726-32.

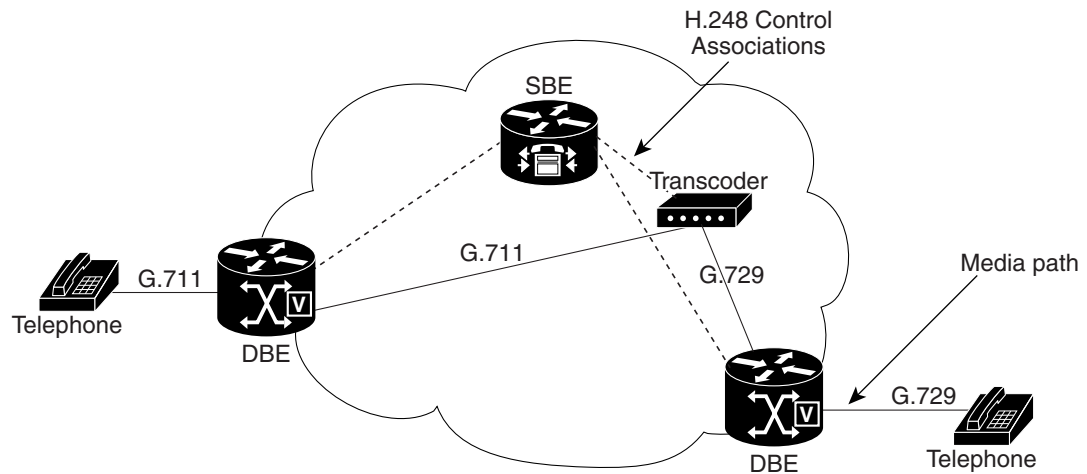
Transcoding requires specialized digital signal processor (DSP) hardware, which is not available within SBC itself. A Cisco MGX 8880 device can be used to provide transcoding function for one or more SBCs.

The SBC automatically brings the transcoding device into use for any call requiring transcoding between these codecs, as long as the Call Admission Control (CAC) policy configuration does not preclude the transcoder service from being supplied for the call. When a call that requires transcoding is set up, the SBE goes through the following steps:

- Receives an initial signaling request from the calling endpoint. This triggers the SBE to perform initial call setup on the incoming and outgoing DBEs. The SBE then forwards the request to the called endpoint.
- Receives a response from the called endpoint that indicates that none of the codecs in the initial request are acceptable. This triggers the SBE to bring a transcoder into the call, which is inserted in the media path between the incoming and outgoing DBEs. A new request is sent to the called endpoint, indicating the new codec type generated by the transcoder.
- SBE may then have to iterate through the list of codecs the transcoder supports until it finds one that is acceptable to the called endpoint. When this is done, the call is connected and media transmission begins.

Figure 16 shows where the transcoder sits in the network, and the path taken by the media in a transcoded call.

Figure 16 Transcoding Configuration

**Note**

Although Figure 16 shows two DBEs, transcoding is possible with a single DBE. With a single DBE, the media flows through the DBE twice, once on its way from the sending endpoint to the transcoder and a second time as it flows from the transcoder to the receiving endpoint.

For SBC to program the transcoder, it must be registered. The transcoding device acts as an H.248 media gateway, so it needs to be configured with the IP address and port of the SBE or SBC to connect to. The SBE or SBC acts as an H.248 Media Gateway Controller. (See the documentation for the transcoder device for notes on how to do this. The documentation for the Cisco MGX 8880 can be found at http://www.cisco.com/en/US/products/hw/gatecont/ps3869/products_configuration_guide_book09186a0080535937.html.)

In addition, the SBE must have the following specific configuration:

- An H.248 control address and port must be configured (using the **sbe control address ipv4** and **sbe control address h248 port** commands). By default, this is on port 2944, and it is the address and port to which the transcoder must connect.
- An explicit media gateway needs to be configured (using the **sbe media-gateway ipv4** command). The explicit media gateway must have its list of supported codecs defined so that the SBC knows which codecs the transcoder can translate between, and it must be identified as a transcoder (using the **sbe media-gateway ipv4 codecs** and **sbe media-gateway ipv4 transcoder** commands).
- The **show services sbc sbe media-gateway-associations** command can be used to check that the transcoder has correctly registered with the SBE. If this has happened, the transcoder should appear in the list of known media gateways with an active association.

How to Implement Transcoding

In this configuration area, the user supplies a configuration for a list of remote media gateways that may need to be managed by the SBE. This is not required when transcoding is not needed.

The primary reason for transcoding configurations is to configure the capabilities of external media transcoding devices when these devices cannot be discovered automatically. In-band auto-discovery of transcoder capabilities is currently not supported. Therefore, this step must be done when configuring all connections to all current remote transcoding devices.

**Note**

Transcoding configurations can be skipped if the described reason does not apply.

By default, media gateways are allowed to connect whether or not configuration has been supplied for them. To help avoid configuration errors, the SBE logs a warning if an incoming connection is received from a media gateway that is not a DBE and does not have transcoding configured.

The basic steps for implementing transcoding are as follows:

1. Configure the IP address, port, and transport protocol for H.248 media gateway controller on SBC. This step may not be required if the Media Gateway Controller has already been configured.
2. Configure the media gateway IP address.
3. Configure the codecs to be transcoded (for example, between G.711ulaw and G.729A).
4. Specify the media gateway as a transcoder.
5. Activate SBE.

This task implements transcoding for SBC.

Once configured, the SBC automatically brings the transcoding device into use for any call requiring transcoding between the codecs as long as the call admission control (CAC) policy configuration does not preclude the transcoder service from being supplied for the call using the **transcode-deny** command (See the “[Configuring Call Admission Control Policy Sets and CAC Tables](#)” section in the “[Implementing SBC Policies](#)” module).

SUMMARY STEPS

1. **configure**
2. **sbc** *service-name*
3. **service-location preferred-active** *node-id* **preferred-standby** *node-id*
4. **sbe**
5. **control address h248 ipv4** *ipv4_IP_address*
6. **control address h248 port** *port-number*
7. **control address h248 transport** [*transport-type*]
8. **media-gateway ipv4** *IPv4_IP_address*
9. **codecs** *codec-list*
10. **transcoder**
11. **exit**
12. **commit**
13. **activate**
14. **show**
15. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: RP/0/0/CPU0:router# configure	Enables global configuration mode.
Step 2	sbc service-name Example: RP/0/0/CPU0:router(config)# sbc mysbc	Enters the mode of an SBC service. Use the <i>service-name</i> argument to define the name of the service.
Step 3	service-location preferred active node-id [preferred standby node-id] Example: RP/0/0/CPU0:router(config-sbc)# preferred-active 0/2/CPU0 preferred-standby 0/4/CPU0	Enables a service card to run SBC function as a primary, and optionally, secondary location.
Step 4	sbe Example: RP/0/0/CPU0:router(config-sbc)# sbe	Enters the mode of an SBE entity within a SBC service.
Step 5	control address h248 ipv4 ipv4_IP_address Example: RP/0/0/CPU0:router(config-sbc-sbe)# control address h248 ipv4 88.88.133.21	Configures an SBE to use a given IPv4 H.248 control address when acting as a media gateway controller.
Step 6	control address h248 port port-number Example: RP/0/0/CPU0:router(config-sbc-sbe)# control address h248 port 2944	Configures an SBE to use a given port for H.248 communications when acting as a media gateway controller. Port 2944 is the default H.248 port. (If using the default port, this step can be skipped.)
Step 7	control address h248 transport [transport-type] Example: RP/0/0/CPU0:router(config-sbc-sbe)# control address h248 transport udp	Configures an SBE to use a given transport for H.248 communications when acting as a media gateway controller. Possible values for the <i>transport-type</i> argument are: <ul style="list-style-type: none"> • udp • tcp
Step 8	media-gateway ipv4 IPv4_IP_address Example: RP/0/0/CPU0:router(config-sbc-sbe)# media-gateway ipv4 10.0.0.1	Enters the mode used to configure media gateways on an SBE.

	Command or Action	Purpose
Step 9	<code>codecs codec-list</code> Example: RP/0/0/CPU0:router(config-sbc-sbe-mg)# codecs "m=audio 6000 RTP/AVPR 4,a=rtpmap:0 PCMU/8000"	Configures the codecs supported by the media gateway. The <i>codec-list</i> argument is a quoted and comma-separated list of the codecs supported.
Step 10	<code>transcoder</code> Example: RP/0/0/CPU0:router(config-sbc-sbe-mg)# transcoder	Configures the media gateway with transcoder support.
Step 11	<code>exit</code> Example: RP/0/0/CPU0:router(config-sbc-sbe-mg)# exit	Exits to the sbe command mode level.
Step 12	<code>commit</code> Example: RP/0/0/CPU0:router(config-sbc-sbe)# commit	Saves configuration changes. Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.
Step 13	<code>activate</code> Example: RP/0/0/CPU0:router(config-sbc-sbe)# activate	Initiates the SBC service after all SBE address configuration has been successfully committed.
Step 14	<code>show</code> Example: RP/0/0/CPU0:router(config-sbc-sbe)# show	Displays current configuration information.
Step 15	<code>end</code> Example: RP/0/0/CPU0:router(config-sbc-sbe)# end	Ends the configuration session.

Configuration Example for Implementing Transcoding

This section provides an example of how to configure transcoding on an SBE:

```
sbc ABC
service-location preferred-active 0/3/CPU0
sbe
control address h248 ipv4 88.88.133.2
control address h248 port 2944
control address h248 transport udp
media-gateway ipv4 200.200.201.101
codecs m=audio 1234 RTP/AVP 0 18,a=rtpmap:0 PCMU/8000,a=rtpmap:18 G729/8000
transcoder
exit
commit
activate
```

Where to Go Next

After configuring SBC transcoding, you can configure the QoS (marking). To configure QoS, see the “[Implementing SBC QoS \(Marking\)](#)” module.

Additional References

The following sections provide references related to implementing SBC transcoding.

Related Documents

Related Topic	Document Title
Cisco IOS XR master command reference	Cisco IOS XR Master Commands List
Cisco IOS XR SBC interface configuration commands	<i>Cisco IOS XR Session Border Controller Command Reference</i>
Initial system bootup and configuration information for a router using the Cisco IOS XR Software	<i>Cisco IOS XR Getting Started Guide</i>
Cisco IOS XR command modes	<i>Cisco IOS XR Command Mode Reference</i>
Cisco MGX 8880 documentation	http://www.cisco.com/en/US/products/hw/gatecont/ps3869/index.html

Standards

Standards	Title
No new or modified standards are supported by this feature, and support from existing standards has not been modified by this feature.	—

MIBs

MIBs	MIBs Link
—	To locate and download MIBs using Cisco IOS XR software, use the Cisco MIB Locator found at the following URL and choose a platform under the Cisco Access Products menu: http://cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport

Related Command Summary

This section provides an alphabetical list of the commands related to transcoding configuration on the Cisco XR 12000 Series Router. For more information about the commands, see the *Cisco IOS XR Session Border Controller Command Reference*.

Command	Purpose
<code>codecs</code> <i>codec-list</i>	Configures the codecs supported by the media gateway.
<code>control address h248 ipv4</code> <i>ipv4_IP_address</i>	Configures an SBE to use a given IPv4 H.248 control address when acting as a media gateway controller.
<code>control address h248 port</code> <i>port-number</i>	Configures an SBE to use a given port for H.248 communications when acting as a media gateway controller.
<code>control address h248 transport</code> [<i>transport-type</i>]	Configures an SBE to use a given transport for H.248 communications when acting as a media gateway controller.
<code>media-gateway ipv4</code> <i>IPv4_IP_address</i>	Enters the mode used to configure media gateways on an SBE.
<code>service-location preferred-active</code> <i>node-id</i> <code>preferred-standby</code> <i>node-id</i>	Enables a service card to run SBC function as a primary, and optionally, secondary location.
<code>show services sbc</code> <i>sbc-name</i> <code>sbe</code> <code>media-gateways</code>	Lists the gateway configuration and attachment status on SBE.
<code>transcoder</code>	Configures the media gateway with transcoder support.