CUBE Transcoding on an MGX or VXSM WAN Switch

CUBE (SBC) transcoding can be done using the DSP farm on an MGX or VXSM WAN switch as a transcoder via the H.248 protocol.

Transcoding is the process of translating one type of media stream or codec into another type of media stream or codec. For example, PCMU into G.726-32.

Transcoding is triggered by a response from the callee endpoint, indicating that none of the codecs in the initial request are acceptable. Responses that trigger transcoding are as follows:

- 415 – Unsupported media type (SIP)
- 488 – Not acceptable here (SIP)
- 65 – Bearer Capability not implemented disconnect cause value (H.323)

When transcoding is triggered, the SBE places a transcoder in the media path between the incoming and outgoing DBEs. The SBE then sends a new request to the callee, with a new codec type generated by the transcoder. The SBE may have to iterate through the list of codecs until it finds one that the callee accepts. Once a codec is found that is accepted by the callee, the call is connected and media transmission begins.

This example shows how to configure CUBE Transcoding on an MGX or VXSM WAN switch. Each segment of the example is explained below.

SBC SBE Configuration

Configures the SBC and SBE.

Media Gateway Configuration

Configures an MGX WAN switch as the media gateway as follows:

- **media-gateway** – Configures the IP address of the MGX WAN switch media gateway.
- **codecs** – Configures the codecs supported by the media gateway.
- **transcoder** – Configures this media gateway as a transcoder.
- **control address h248 index** – Configures the IPv4, H.248 control address of this transcoder.
- **transport udp** – Configures UDP as the transport for the H.248 signaling.
- **ipv4** – Configures the IP address of the SBC.

Adjacency Configuration

Configures the Nav_A and Nav_B adjacencies.

Call Policy: Adjacency Connection

Establishes the connection between the Nav_A and Nav_B adjacencies.

CAC Table: Codec Enforcement

(Optional) Enforces which codecs each side of the call is allowed to use.

Transcoding CUBE on the MGX (in Segments)

SBC Configuration

```
sbc My_SBC
  sbe
```

MGX as Media Gateway Configuration

```
media-gateway ipv4 10.0.181.2
    codecs m=audio 1234 RTP/AVP 0 8,a=rtpmap:0 PCMU/8000,a=rtpmap:8 PCMA/8000
    transcoder
    control address h248 index 1
    transport udp
    ipv4 23.30.1.1 - SBC ip address
```

Adjacency 1 Configuration

```
  adjacency sip Nav_A
   inherit profile preset-access
   preferred-transport udp
   signaling-address ipv4 23.30.1.1
   statistics method summary
   signaling-port 5060
   remote-address ipv4 23.31.0.0 255.255.0.0
   signaling-peer 23.31.1.2
   attach
```

Adjacency 2 Configuration

```
adjacency sip Nav_B
    nat force-off
    preferred-transport udp
    signaling-address ipv4 23.30.1.1
    statistics method summary
    signaling-port 5060
    remote-address ipv4 23.32.0.0 255.255.0.0
    signaling-peer 23.32.1.2
    account Nav_B
    attach
```

Call Policy: Adjacency Connection

```
  call-policy-set 1
    first-call-routing-table ROUTE-ON-DEST-NUMB
    rtg-dst-address-table ROUTE-ON-DEST-NUMB
     entry 1
      action complete
      dst-adjacency Nav_A
      match-address 91939 digits
      prefix
     entry 2
      action complete
      dst-adjacency Nav_B
      match-address 40852 digits
      prefix
    complete
```

```
call-policy-set default 1
media-address ipv4 23.30.1.10
port-range 10000 64000 any
activate
```

CAC Policy: Codec Enforcement

```
cac-policy-set 1
    first-cac-table Transcode
    first-cac-scope dst-adjacency
    cac-table Transcode
     table-type policy-set
     entry 1
      cac-scope call
      caller-codec-list sideA
      callee-codec-list sideB
      action cac-complete
     complete
    cac-policy-set global 1
<…>
    codec list sideA
     codec PCMA
    codec list sideB
     codec G729
```

Transcoding CUBE on the MGX (for Copy and Paste)

```
sbc My_SBC
  sbe

media-gateway ipv4 10.0.181.2
    codecs m=audio 1234 RTP/AVP 0 8,a=rtpmap:0 PCMU/8000,a=rtpmap:8 PCMA/8000
    transcoder
    control address h248 index 1
    transport udp
    ipv4 23.30.1.1 - SBC ip address

adjacency sip Nav_A
    inherit profile preset-access
    preferred-transport udp
    signaling-address ipv4 23.30.1.1
    statistics method summary
    signaling-port 5060
    remote-address ipv4 23.31.0.0 255.255.0.0
    signaling-peer 23.31.1.2
    attach

adjacency sip Nav_B
    nat force-off
    preferred-transport udp
    signaling-address ipv4 23.30.1.1
    statistics method summary
    signaling-port 5060
    remote-address ipv4 23.32.0.0 255.255.0.0
    signaling-peer 23.32.1.2
    account Nav_B
    attach

call-policy-set 1
    first-call-routing-table ROUTE-ON-DEST-NUMB
    rtg-dst-address-table ROUTE-ON-DEST-NUMB
    entry 1
        action complete
        dst-adjacency Nav_A
        match-address 91939 digits
        prefix
    entry 2
        action complete
        dst-adjacency Nav_B
        match-address 40852 digits
        prefix
    complete
    call-policy-set default 1
    media-address ipv4 23.30.1.10
    port-range 10000 64000 any
    activate


cac-policy-set 1
    first-cac-table Transcode
    first-cac-scope dst-adjacency
    cac-table Transcode
    table-type policy-set
    entry 1
        cac-scope call
        caller-codec-list sideA
        callee-codec-list sideB
        action cac-complete
```

```
complete
cac-policy-set global 1
codec list sideA
    codec PCMA
    codec list sideB
    codec G729
```

Transcoding CUBE on the MGX (with CLI Prompts)

```
Router# config t
Router(config)# sbc My_SBC
Router(config-sbc)# sbe


PE25_ASR-1004(config-sbc-sbe)# media-gateway ipv4 10.0.181.2
PE25_ASR-1004(config-sbc-sbe-mg)# codecs m=audio 1234 RTP/AVP 0 8,a=rtpmap:0
PCMU/8000,a=rtpmap:8 PCMA/8000
PE25_ASR-1004(config-sbc-sbe-mg-codecs)# transcoder
PE25_ASR-1004(config-sbc-sbe-mg-codecs)# control address h248 index 1
PE25_ASR-1004(config-sbc-sbe-ctrl-h248)# transport udp
PE25_ASR-1004(config-sbc-sbe-ctrl-h248)# ipv4 23.30.1.1
PE25_ASR-1004(config-sbc-sbe-ctrl-h248)# exit


Router(config-sbc-sbe)# adjacency sip Nav_A
Router(config-sbc-sbe-adj-sip)# inherit profile preset-access
Router(config-sbc-sbe-adj-sip)# preferred-transport udp
Router(config-sbc-sbe-adj-sip)# signaling-address ipv4 23.30.1.1
Router(config-sbc-sbe-adj-sip)# statistics method summary
Router(config-sbc-sbe-adj-sip)# signaling-port 5060
Router(config-sbc-sbe-adj-sip)# remote-address ipv4 23.31.0.0 255.255.0.0
Router(config-sbc-sbe-adj-sip)# signaling-peer 23.31.1.2
Router(config-sbc-sbe-adj-sip)# attach
Router(config-sbc-sbe-adj-sip)# exit

Router(config-sbc-sbe)# adjacency sip Nav_B
Router(config-sbc-sbe-adj-sip)# nat force-off
Router(config-sbc-sbe-adj-sip)# preferred-transport udp
Router(config-sbc-sbe-adj-sip)# signaling-address ipv4 23.30.1.1
Router(config-sbc-sbe-adj-sip)# statistics method summary
Router(config-sbc-sbe-adj-sip)# signaling-port 5060
Router(config-sbc-sbe-adj-sip)# remote-address ipv4 23.32.0.0 255.255.0.0
Router(config-sbc-sbe-adj-sip)# signaling-peer 23.32.1.2
Router(config-sbc-sbe-adj-sip)# account Nav_B
Router(config-sbc-sbe-adj-sip)# attach
Router(config-sbc-sbe-adj-sip)# exit

Router(config-sbc-sbe)# call-policy-set 1
Router(config-sbc-sbe-rtgpolicy)# first-call-routing-table ROUTE-ON-DEST-NUMB
Router(config-sbc-sbe-rtgpolicy)# rtg-dst-address-table ROUTE-ON-DEST-NUMB
Router(config-sbc-sbe-rtgpolicy)#entry 1
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# action complete
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# dst-adjacency Nav_A
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# match-address 91939 digits
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# prefix
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# entry 2
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# action complete
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# dst-adjacency Nav_B
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# match-address 40852 digits
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# prefix
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# complete
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# call-policy-set default 1
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# media-address ipv4 23.30.1.10
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# port-range 10000 64000 any
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# activate
Router(config-sbc-sbe-rtgpolicy-rtgtable-entry)# exit


Router(config-sbc-sbe)# cac-policy-set 1
Router(config-sbc-sbe-cacpolicy)# first-cac-table Transcode
```

```
Router(config-sbc-sbe-cacpolicy)# first-cac-scope dst-adjacency
Router(config-sbc-sbe-cacpolicy)# cac-table Transcode
Router(config-sbc-sbe-cacpolicy-cactable)# table-type policy-set
Router(config-sbc-sbe-cacpolicy-cactable)# entry 1
Router(config-sbc-sbe-cacpolicy-cactable-entry)# cac-scope call
Router(config-sbc-sbe-cacpolicy-cactable-entry)# caller-codec-list sideA
Router(config-sbc-sbe-cacpolicy-cactable-entry)# callee-codec-list sideB
Router(config-sbc-sbe-cacpolicy-cactable-entry)# action cac-complete
Router(config-sbc-sbe-cacpolicy-cactable-entry)# complete
Router(config-sbc-sbe-cacpolicy-cactable-entry)# cac-policy-set global 1
Router(config-sbc-sbe)# codec list sideA
Router(config-sbc-sbe-codec-list)# codec PCMA
Router(config-sbc-sbe-codec-list)# codec list sideB
Router(config-sbc-sbe-codec-list)# codec G729
Router(config-sbc-sbe-codec-list)# exit
```

Verify Media Gateway Associations

```
Router# show sbc My_SBC sbe media-gateway-associations

SBC Service "My_SBC"
  Media gateway 10.0.181.2:2951
    Gateway Protocol   = megaco
    Transport Protocol = UDP^M
    Local Address      =23.30.1.1:2944

               Sent           Received        Failed          Retried
    Requests        55              2               0               0
    Replies          2             55              –                0
```