

# CallManager and IOS Gateway DSP Farm Configuration Example

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## Introduction

This document demonstrates how to configure a Cisco IOS® gateway as a Digital Signal Processor (DSP) Farm with Cisco CallManager. The examples in this document are from a gateway that uses a High Density Voice Network Module (NM-HDV) for Transcoding and Conferencing resources. The NM-HDV module is supported on the Cisco 2600XM, Cisco 2691, Cisco 3725, Cisco 3745, Cisco 3660, Cisco 3640, Cisco 3620, Cisco 2600, and Cisco VG200 gateways.

# Prerequisites

## Requirements

**Note:** This document assumes that you have configured Device Pools, Regions, Media Resource Groups, and Media Resource Lists in Cisco CallManager. The focus of this document is on the IOS Gateway DSP Farm configuration and how to configure Transcoding and Conferencing resources in Cisco CallManager.

Readers of this document need to have knowledge of these topics:

- Cisco CallManager
- DSP Farms
- Transcoding and Conferencing

## Components Used

The information in this document is based on these software and hardware versions:

- Cisco CallManager version 4.1
- Cisco IOS Software Release 12.4(5b)
- Cisco 2651 Gateway
- NM-HDV with two Packet Voice DSP Module (PVDM) DSP Single In-line Memory Modules (SIMMS)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

## Conventions

Refer to the [Cisco Technical Tips Conventions](#) for more information on document conventions.

## Plan for the Number of DSPs Installed

The NM-HDV Farm module ships with two SIMMS and is able to handle three additional SIMMS. Each SIMM contains three DSPs. Each DSP supports four Transcoding sessions or one Conference Bridge. Four Transcoding sessions are supported for g729-g711. If you use the Global System for Mobile communication (GSM), then the DSPs can handle three Transcoding sessions. Therefore, the maximum number of Transcoding sessions supported by a five-SIMM configuration is sixty Transcoding sessions. The maximum number of conference calls supported by a five-SIMM configuration is fifteen. The Conference Bridges and Transcoder sessions configured count against the cumulative total and cannot exceed the limit of what is supported by the number of DSPs installed.

# IOS Gateway Configuration

**Note:** Replace parameters highlighted in *italics* with values particular to your network, if applicable.

This section presents you with the information you can use in order to configure the features this document describes.

**Note:** Refer to the [Command Lookup Tool](#) ( [registered](#) customers only) in order to find additional information on the commands this document uses.

## Enable Voice Card Services

Perform these tasks in order to configure DSP Farm services for a particular digital T1/E1 packet voice trunk network module (NM-HDV) or High Density Voice (HDV) Transcoding/Conferencing DSP Farm (NM-HDV-FARM).

```
Gateway#configure terminal  
Gateway(config)#voice-card 1
```

```
Gateway(config-voicecard)#dsp services dspfarm
```

```
!--- Note: Use this command before enabling DSP-farm services with  
!--- the dspfarm command for an NM-HDV or NM-HDV-FARM.
```

## Enable the DSPFARM

Perform these tasks in order to add a specified voice card to those that participate in a DSP resource pool and in order to configure Transcoding and Conference Bridge maximum sessions.

**Note:** This example is for two SIMMS with three DSPs each for a total of six DSPs. The three Conference Bridges use one DSP each and the twelve Transcoding sessions require three DSPs for a total of six.

```
Gateway#configure terminal  
Gateway(config)#dspfarm transcoder maximum sessions 12
```

```
Gateway(config)#dspfarm confbridge maximum sessions 3
```

```
Gateway(config)#dspfarm  
Gateway(config)#dspfarm rtp timeout 60
```

```
Gateway(config)#dspfarm connection interval 60
```

Use these commands if you want to disable G.729 VAD:

```
Gateway#configure terminal  
Gateway(config)#dspfarm codec g729 vad disable
```

**Note:** Follow the guidelines in the [Plan for the Number of DSPs Installed](#) section when you configure Transcoder and Conference Bridge maximum session numbers.

**Note:** Refer to [Configuring Enhanced Conferencing and Transcoding for Voice Gateway Routers](#) for command details.

## Enable SCCP Gateway Mode

Perform these tasks in order to enable the Skinny Client Control Protocol (SCCP) protocol and its related applications (Transcoding and Conferencing).

```
Gateway#configure terminal
Gateway(config)#sccp
Gateway(config)#sccp local FastEthernet 0/0

Gateway(config)#sccp ccm 10.82.84.144 priority 1
```

Issue these commands in order to configure a connection to a second Cisco CallManager.

```
Gateway(config)#sccp ccm 10.82.84.145 priority 2

Gateway(config)#sccp switchback timeout guard 180
```

**Note:** Refer to [Configuring Enhanced Conferencing and Transcoding for Voice Gateway Routers](#) for command details.

## Configure Dial Peers for Transcoding

When you need to make calls to H.323 endpoints (in this example, 854....), configure a dial peer and make the session target IP address that of the Cisco CallManager.

```
Gateway(config)#dial-peer voice 10 voip
Gateway(config-dial-peer)#destination-pattern 854....

Gateway(config-dial-peer)#session target ipv4:10.82.84.144
```

## Configure Dial Peers for Conferencing

When you need to make calls to IP phones for conferencing, configure a dial peer and make the session target IP address that of the Cisco CallManager.

```
Gateway(config)#dial-peer voice 11 voip
Gateway(config-dial-peer)#destination-pattern 552....

Gateway(config-dial-peer)#session target ipv4:10.82.84.144

Gateway(config-dial-peer)#codec g711alaw
```

## Cisco CallManager Configuration

# Cisco IOS MTP Configuration Settings

Table 1: Cisco IOS MTP Configuration Settings

Field	Description
Media Termination Point Type	Choose <b>Cisco IOS Media Termination Point</b> .
Description	Enter any description for the MTP.
Device Name	<p>Enter MTPxxxxxxxxxx where xxxxxxxxxxxx is the MAC address of interface used in the <b>sccp local interface</b> command.</p> <p><b>Tip:</b> Obtain the MAC address of the <b>sccp local interface</b> with the use of the <b>show interface interface name</b> command. Verify that you use the correct interface by making sure the interface IP address matches the Gateway IP address from the <b>show sccp</b> command. Use the <b>show ip interface brief</b> command for a list of interface names and IP addresses.</p>
Device Pool	Choose a device pool that has the highest priority within the Cisco CallManager group that you use or choose <b>Default</b> .

In this example, the interface is FastEthernet 0/0. Obtain the MAC address of FastEthernet 0/0 with the use of the **show interface FastEthernet 0/0** command.

```

Gateway#show interface FastEthernet 0/0

FastEthernet0/0 is up, line protocol is up
  Hardware is AmdFE, address is 0009.43b8.5660 (bia 0009.43b8.5660)
  Internet address is 10.82.84.54/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  Full-duplex, 100Mb/s, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Input queue: 1/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 7000 bits/sec, 10 packets/sec
  5 minute output rate 3000 bits/sec, 4 packets/sec

```

This figure shows a successfully registered Transcoder resource in Cisco CallManager.



## Transcoder Configuration

[Add a New Transcoder](#)  
[Back to Find/List Transcoders](#)  
[Dependency Records](#)

**Transcoder:** MTP000943B85660 (DSP Farm Transcoder)  
**Registration:** Registered with Cisco CallManager 10.82.84.144  
**IP Address:** [10.82.84.54](#)

Status: Ready

Transcoder Type: Cisco IOS Media Termination Point  
 Description:   
 Device Name\*:   
 Device Pool\*:  [\(View details\)](#)  
 Special Load Information:  (Leave blank to use default)

\* indicates required item

## Cisco IOS Conference Bridge Configuration Settings

Table 2: Cisco IOS Conference Bridge Configuration Settings

Field	Description
Conference Bridge Type	Choose <b>Cisco IOS Conference Bridge</b> .
Conference Bridge Name	<p>Enter CFBxxxxxxxxxxx, where xxxxxxxxxxxx is the MAC address of interface used in the <b>sccp local interface</b> command..</p> <p><b>Tip:</b> Obtain the MAC address of the SCCP local interface with the use of the <b>show interface interface name</b> command. Verify that you use the correct interface by making sure the interface IP address matches the Gateway IP address from the <b>show sccp</b> command. Use the <b>show ip interface brief</b> command for a list of interface names and IP addresses.</p>

Description	Enter any description for the Conference Bridge.
Device Pool	Choose a device pool that has the highest priority within the Cisco CallManager group that you use or choose <b>Default</b> .

In this example, the interface is FastEthernet 0/0. Obtain the MAC address of FastEthernet 0/0 by the use of the **show interface FastEthernet 0/0** command.

```
Gateway#show interface FastEthernet 0/0

FastEthernet0/0 is up, line protocol is up
  Hardware is AmdFE, address is 0009.43b8.5660 (bia 0009.43b8.5660)
  Internet address is 10.82.84.54/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  Full-duplex, 100Mb/s, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Input queue: 1/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 7000 bits/sec, 10 packets/sec
  5 minute output rate 3000 bits/sec, 4 packets/sec
```

## Verify the IOS Gateway

This section provides information you can use in order to confirm your IOS Gateway configuration works properly.

The [Output Interpreter Tool](#) ( [registered](#) customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

## Verify the SCCP Configuration

Issue the **show sccp** command in order to verify the SCCP configuration.

```
Gateway#show sccp
SCCP Admin State: UP
Gateway IP Address: 10.82.84.54
Switchover Method: IMMEDIATE, Switchback Method: GUARD_TIMER
Switchback Guard Timer: 1200 sec, IP Precedence: 5
Max Supported MTP sessions: 0
User Masked Codec list: None
Call Manager: 10.82.84.144, Port Number: 2000
                Priority: 1, Version: 3.1 or Higher
```

## Verify the DSP Farm Configuration

Issue the **show dspfarm** command in order to verify the DSP Farm configuration.

```
Gateway#show dspfarm
DSPFARM Configuration Information:
Admin State: UP, Oper Status: ACTIVE - Cause code: NONE
Transcoding Sessions: 12(Avail: 12), Conferencing Sessions: 3 (Avail: 3)
Trans sessions for mixed-mode conf: 0 (Avail: 0), RTP Timeout: 600
Connection check interval 600 Codec G729 VAD: ENABLED
```

## Verify DSP Farm Resource Registration on the Gateway

Issue the **show sccp** command in order to verify the Transcoder and Conference Bridge registration from the gateway.

```
Gateway#show sccp
SCCP Admin State: UP
Gateway IP Address: 10.82.84.54
Switchover Method: IMMEDIATE, Switchback Method: GUARD_TIMER
Switchback Guard Timer: 1200 sec, IP Precedence: 5
Max Supported MTP sessions: 0
User Masked Codec list: None
Transcoding Oper State: ACTIVE - Cause Code: NONE
Active Call Manager: 10.82.84.144, Port Number: 2000
TCP Link Status: CONNECTED
Conferencing Oper State: ACTIVE - Cause Code: NONE
Active Call Manager: 10.82.84.144, Port Number: 2000
TCP Link Status: CONNECTED
Call Manager: 10.82.84.144, Port Number: 2000
                Priority: 1, Version: 3.1 or Higher
```

## Verify Cisco CallManager

This section provides information you can use in order to confirm your Cisco CallManager configuration works properly.

This figure shows a successfully registered Conference Bridge resource in Cisco CallManager.



## Conference Bridge Configuration

[Add a New Conference Bridge](#)  
[Meet-Me Number/Pattern Configuration](#)  
[Cisco CallManager Service Parameters](#)  
[Back to Find/List Conference Bridges](#)  
[Dependency Records](#)

**Conference Bridge: CFB000943B85660 (DSP Farm Conference Bridge)**

**Registration: Registered with Cisco CallManager 10.82.84.144**

**IP Address: [10.82.84.54](#)**

Status: Insert completed

Conference Bridge Type Cisco IOS Conference Bridge

Conference Bridge Name\*

Description

Device Pool\*

Location

\* indicates required item

## Troubleshoot

Unable to configure the available DSP to be used for hardware conferencing in Cisco CallManager on an IOS voice gateway with DSP resources already allocated.

Conferencing needs a dedicated DSP resource. If a DSP is assigned for a conferencing session, then it cannot be used for transcoding or voice call initiations, or terminations. However, transcoding and voice calls can share the resource of a single DSP. Conferencing needs a dedicated DSP, but not a dedicated packet-voice DSP module (PVDM)2. For example, PVDM2-64 contains four DSPs. If one DSP is used for conferencing, the other three DSPs can still be used for other purposes. Once the DSPs are assigned to the PRI, they cannot be used for other purposes. However, you can use the remaining DSPs.

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| Mixed MCS Cluster...        | iptuser55                     | 2 replies  | Nov 4, 2009, 7:55am PST   |
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## Related Information

- [Configuring Enhanced Conferencing and Transcoding for Voice Gateway Routers](#)
- [Cisco IOS Voice Command Reference](#)
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- Recommended Reading: [Troubleshooting Cisco IP Telephony](#) 
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