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# Understanding High Density Voice Network Modules

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## Introduction

The IP Communications High Density Voice Network Modules combine WAN Interface Card (WIC) and Voice Interface Card (VIC) functionality to provide unparalleled flexibility and power. The High Density Voice Network Module can support up to 60 simultaneous mid-complexity voice compression codecs or algorithms.

The IP Communications High Density Digital Voice/Fax Network Modules deliver these functions:

- high density digital voice connectivity
- high density WAN connectivity
- analog voice connectivity
- capability to conference and transcode in a network module form factor

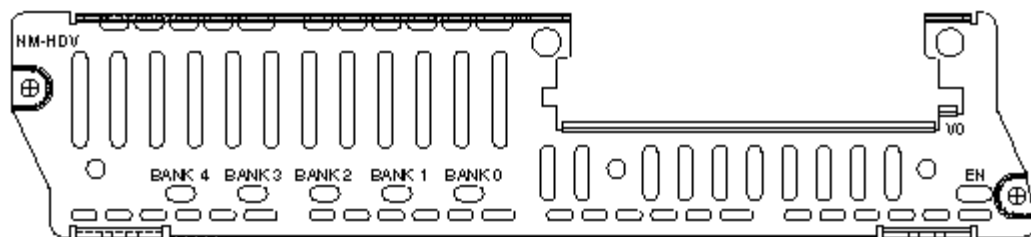
The network modules provide enterprises, managed service providers, and service providers with the ability to directly connect devices to Cisco<sup>®</sup> 2600XM, Cisco 2691, 2811, 2821, 2851, Cisco 3700 Series and Cisco 3800 Series Access Routers for either IP Communications capabilities or pure toll bypass. These are the devices:

- public switched telephone network (PSTN)
- traditional telephony equipment, such as private branch exchange (PBX), key systems, analog telephones, and fax machines
- WAN

The IP Communications High Density Digital Voice/Fax Network Modules flexibly operates within these two different Cisco Architecture for Voice, Video and Integrated Data (AVVID) IP Telephony environments:

- Cisco CallManager system with Survivable Remote Site Telephony (SRST)
- Cisco CallManager Express

The network modules can be integrated with these IP Telephony solutions in a Multiservice Access Router in order to provide a complete IP Communications solution for full service branch customers.



## Prerequisites

### Requirements

Cisco recommends that you have knowledge of basic Voice over IP (VoIP) concepts and configuration.

### Components Used

This document is not restricted to specific software and hardware versions.

### Conventions

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

## Product Numbers

This table lists the High Density Voice Network Module and the product number that corresponds:

Network Module	Product Number
NM-HDV-1E1-12	High Density Voice Network Module, with 1 <a href="#">Voice/WAN Interface Card (VWIC)-1MFT-E1</a> and 1 Packet Voice DSP Module (PVDM)-12
NM-HDV-1E1-30	High Density Voice Network Module, with 1 <a href="#">VWIC-1MFT-E1</a> and 3 PVDM-12

NM-HDV-1E1-30E	High Density Voice Network Module, with 1 <a href="#">VWIC-1MFT-E1</a> and 5 PVDM-12
NM-HDV-2E1-60	High Density Voice Network Module, with 1 <a href="#">VWIC-2MFT-E1-DI</a> and 5 PVDM-12
NM-HDV-1T1-12	High Density Voice Network Module, with 1 <a href="#">VWIC-1MFT-T1</a> and 1 PVDM-12
NM-HDV-1T1-24	High Density Voice Network Module, with 1 <a href="#">VWIC-1MFT-T1</a> and 2 PVDM-12
NM-HDV-1T1-24E	High Density Voice Network Module, with 1 <a href="#">VWIC-1MFT-T1</a> and 4 PVDM-12
NM-HDV-2T1-48	High Density Voice Network Module, with 1 <a href="#">VWIC-2MFT-T1-DI</a> and 4 PVDM-12
NM-HDV-1J1-30	High Density Voice Network Module, with Single-Port 30 Channel J1 Voice/Fax Network Module <a href="#">NM-HDV-1J1-30E</a>
NM-HDV-1J1-30E	High Density Voice Network Module, with Single-Port 30 Enhanced Channel J1 Voice/Fax Network Module <a href="#">NM-HDV-1J1-30E</a>
NM-HDV	High Density Voice Network Module (no VWIC, no PVDMs)
PVDM-12	12-Channel Packet Voice Digital Signal Processor (DSP) Module

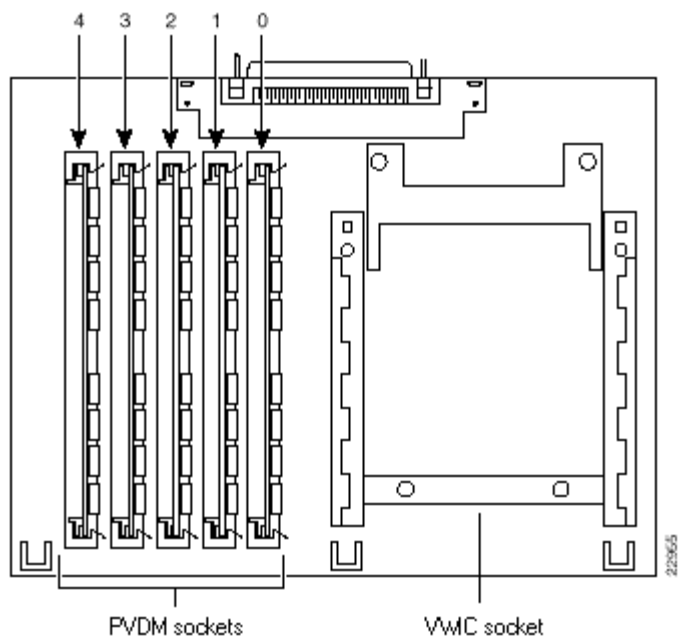
## Features

The features of High Density Voice Network Modules are explained in this section.

Signaling	Minimum Cisco IOS Required
T1 CAS	12.0(5)XK, 12.0(7)T, 12.1(1), 12.1(1)T
T1 ISDN PRI Q.SIG and Q.931	12.1(2)XH, 12.1(3)T
E1 ISDN PRI Q.SIG	12.0(7)XK, 12.1(2)T
E1 ISDN Q.931	12.1(2)XH, 12.1(3)T
E1 R2	12.1(2)XH, 12.1(3)T

- Supports 1 or 2 T1 or E1 interfaces.
- Uses VWICs to supply physical interface ([1 and 2 Port T1 Multi-Flex Trunk VWIC](#)) ([1 and 2 Port E1 Multi-Flex Trunk VWIC](#)).
- Each PVDM-12 contains 3 TI 549 DSPs.
  - Runs up to twelve voice calls using a medium complexity CODEC (G.711, G.729a/b, G.726, fax).
  - Runs up to six voice calls using a high complexity CODEC (G.729, G.728, G.723.1).
  - PVDM-12 fits into SIMM sockets on the NM-1HDV network module
  - Five PVDM SIMM sockets on the NM-1HDV network module

### High Density Network Module Top View

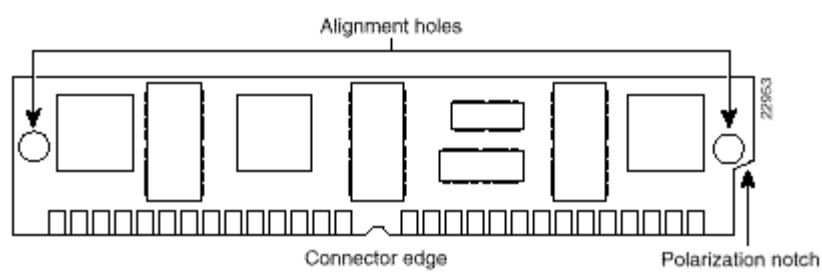


DSP IDs on the NM-HDV PVDM-12—When you configure the ds0-group or pri-group, the timeslots are assigned DSP channels dynamically. The IDs of the DSPs are:

- The DSPs on the PVDM-12 on SIMM socket 4 have an id=0,1,2
- The DSPs on the PVDM-12 on SIMM socket 3 have an id=3,4,5
- The DSPs on the PVDM-12 on SIMM socket 2 have an id=6,7,8
- The DSPs on the PVDM-12 on SIMM socket 1 have an id=9,10,11
- The DSPs on the PVDM-12 on SIMM socket 0 have an id=12,13,14

Issue the **show voice dsp** command to view DSP ID information.

**PVDM (Packet Voice DSP Module)**



**Platform Support**

This table outlines the platform support:

IOS 1	VG200	2600	2600XM	3620, 3640	3631	3660	2691, 3725,	Catalyst 4000 WS-
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Support							3745	X4604 AGM
<b>NM-HDV-1E1-12</b>		12.0(7)XK, 12.1(2)T, 12.2, 12.2T	12.2(8)T1	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	Not Supported	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	All IOS Versions	
<b>NM-HDV-1E1-30</b>	12.1(5)XM1	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	12.2(8)T1	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	Not Supported	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	All IOS Versions	Not Supported
<b>NM-HDV-1E1-30E</b>	12.1(5)XM1	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	12.2(8)T1	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	Not Supported	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	All IOS Versions	Not Supported
<b>NM-HDV-2E1-60</b>	12.1(5)XM1	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	12.2(8)T1	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	Not Supported	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	All IOS Versions	Not Supported
<b>NM-HDV-1T1-12</b>		12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	Not Supported	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	
<b>NM-HDV-1T1-24</b>	12.1(3)T	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	Not Supported	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	Not Supported
<b>NM-HDV-1T1-24E</b>	12.1(3)T	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	Not Supported	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	Not Supported
<b>NM-HDV-2T1-48</b>	12.1(3)T	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	Not Supported	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	Not Supported

<b>NM-HDV</b>	12.1(3)T	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	Not Supported	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	Not Supported
<b>PVDM-12</b>	12.1(3)T	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	Not Supported	12.0(5)XK, 12.0(7)T, 12.1, 12.1T, 12.2, 12.2T	All IOS Versions	Not Supported

<sup>1</sup> Requires a Cisco IOS Plus feature set.

### NM-HDAs Supported in Each Platform

Platform	Maximum Number of NM-HDAs Allowed
2600/2600XM/2691	1
2811/2821/2851	1
3640/A	3
3660	6
3725	2
3745	4
3825	2
3845	4

**Note:** The Cisco IOS versions provided are typically the minimum version required to support the platform, module or feature in question. Use the [Software Advisor Tool](#) ([registered](#) customers only) for a complete list of Cisco IOS software versions in which a particular feature, module, interface card, or chassis is supported.

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