

Cisco High-Density Packet Voice Digital Signal Processor Modules

This document answers frequently asked questions about the Cisco® High-Density Pack Voice Digital Signal Processor Modules (PVDM2 and PVDM3).

General

Q. What is a PVDM? What function does it provide on the Cisco Integrated Service Routers?

A. A Packet Voice Digital Signal (PVDM) is a hardware module that provides digital-signal-processor (DSP) resources to the system. A PVDM module can be populated with one or more DSPs. The DSP resources on a PVDM module provide collaboration services including voice sessions, transcoding sessions, conference sessions, and video.

Q. How many types of PVDMs are available?

A. Two PVDM versions are currently supported, the PVDM2 series modules and the PVDM3 series modules. The Cisco 2800 and 3800 Series platforms support only the PVDM2 modules. The Cisco 2900 and 3900 Series platforms support both the PVDM2 and PVDM3 modules. The PVDM3 modules provide higher density (up to 4 times higher) than the PVDM2s. They also provide improved performance in terms of the number of conference and transcoding sessions supported.

Q. What are the different PVDM3 modules?

A. Table 1 lists the PVDM3 models.

Table 1. PVDM3 Models

Name	Description
PVDM3-16	16-channel high-density voice and video DSP module
PVDM3-32	32-channel high-density voice and video DSP module
PVDM3-64	64-channel high-density voice and video DSP module
PVDM3-128	128-channel high-density voice and video DSP module
PVDM3-192	192-channel high-density voice and video DSP module
PVDM3-256	256-channel high-density voice and video DSP module

Q. What are the different PVDM2 modules?

A. Table 2 lists the PVDM2 models.

Table 2. PVDM2 Models

Name	Description
PVDM2-8	8-channel packet fax/voice DSP module
PVDM2-16	16-channel packet fax/voice DSP module
PVDM2-32	32-channel packet fax/voice DSP module
PVDM2-48	48-channel packet fax/voice DSP module
PVDM2-64	64-channel packet fax/voice DSP module

Q. What codecs do the PVDM2 and PVDM3 modules support?

A. Table 3 lists supported codecs.

Table 3. Supported Codecs

High-Complexity Codecs	Medium-Complexity Codecs	Low-Complexity Codecs
G.723.1 (PVDM2 only), G.728, G.729, G.729B, Internet Low Bit Rate Codec (iLBC), and Modem Relay	G.729A, G.729AB, G.726, G.722, and Fax Relay	G.711 and clear-channel codec

PVDM3**Q. What are the benefits of using PVDM3 modules?**

A. PVDM3s offer the following benefits:

- Increased density and more processing power than PVDM2s, thus allowing additional future rich-media applications.
- Investment protection and field-upgrade capabilities.
- Up to 4 times the channel density of PVDM2s.
- Analog and digital voice connection support.
- Support for voice connections, universal any-to-any transcoding, G.711-to-any transcoding, and conferencing services on the same DSP with a single DSP image.
- Support for more conferences and more participants (up to 64) per conference than the PVDM2s.
- Perform compression, voice-activity-detection, jitter-management, and echo-cancellation functions.
- Integration with a multi-gigabit fabric (MGF) on the Cisco 2900 and 3900 Series platforms to provide higher IP throughput within the system.
- Provide power-saving options when the DSPs are not in use.
- Introduce support for fast-busy-tone broadcast for DSP oversubscription.

Q. Which Cisco platforms or voice network modules support the PVDM3 modules? Which Cisco IOS® Software release do I need?

A. You can install PVDM3 modules in the DSP slots on the motherboard of the Cisco 2900 and 3900 Series platforms starting with Cisco IOS Software Release 15.0.1(M).

Q. What do the numbers 16, 32, 64, etc. in the PVDM3 product number mean?

A. The numbers indicate the maximum number of G.711 voice calls that a particular PVDM3 module can support.

Q. Where is a PVDM3 module installed?

A. You can install PVDM3 modules in the PVDM3 slots on the motherboard of the Cisco 2900 and 3900 Series platforms.

Q. Are the PVDM3 modules supported in a NM-HDV2?

A. No. You cannot install PVDM3 modules directly on the PVDM slots of an NM-HDV2, only the PVDM2s are supported by the NM-HDV2. However, an NM-HDV2 that has no PVDMs installed at all can share PVDM3 DSP resources from the router motherboard PVDM slots across the chassis backplane.

Q. Do the PVDM2 modules work with the Cisco 2900 and 3900 Series platforms?

A. Yes. You can install PVDM2 modules on the motherboard PVDM slots using special adaptor cards (PVDM2-ADPTR). You can also insert an NM-HDV2 module with PVDM2 modules into the service-module slot of the Cisco 2900 and 3900 Series platforms using the network-to-server module adaptor card (SM-NM-ADPTR).

Q. Can PVDM2 and PVDM3 modules coexist on the Cisco 2900 and 3900 Series platforms?

A. Yes, they can coexist as long as they are not both installed in the same domain. The motherboard PVDM slots form one domain and each SM slot forms a separate domain. The motherboard domain can contain either all PVDM2 modules or all PVDM3 modules. An SM domain can only contain PVDM2 modules housed by the NM-HDV2 carrier card. If a mix of PVDM2s and PVDM3s are detected on the motherboard slots, then the PVDM2s will be deactivated, allowing only the PVDM3s to be used actively. If PVDM2s are detected in service-module slots and PVDM3s are installed on the motherboard, then both will continue to function in their own domain and coexist.

Q. Can I replace a PVDM2 with the PVDM3 in a Cisco 2800 and 3800 Series platforms?

A. No, the PVDM3 modules are only supported on the Cisco 2900 and 3900 Series platforms.

Q. Do the PVDM3 modules have feature parity with PVDM2s?

A. Yes, all features supported by PVDM2s are supported on PVDM3s, with the exception of Cisco Fax Relay and G.723. Cisco Fax Relay and G.723 are no longer supported on PVDM3s. Customer can still use PVDM2 to obtain G.723 codec support or use G.729 codec on PVDM3 as alternatives.

Q. Can conferencing, transcoding and voice calls be supported on a single DSP?

A. Yes. The PVDM3 modules have a universal firmware image that allows sharing DSP resources between transcoding, voice, and conference calls. On the PVDM2 you can use the same DSP for voice and transcoding calls, but a different DSP firmware image is required for conference calls requiring a DSP to be dedicated when conferencing is configured.

Q. Can I configure conferencing and transcoding profiles on the Cisco 2900 and 3900 Series platforms that have PVDM2 and PVDM3 modules?

A. Yes. Allocation of DSP resources follows a round-robin algorithm starting from the DSP resources on the motherboard. No distinction is made regarding the type of DSP (PVDM2 or PVDM3) installed in those slots while resources are allocated.

Q. How many voice sessions does each PVDM3 module support?

A. Table 4 lists the maximum number of supported voice channels on each PVDM3 module.

Table 4. Supported Channels

Complexity	PVDM3-16	PVDM3-32	PVDM3-64	PVDM3-128	PVDM3-192	PVDM3-256
Low-complexity voice	16	32	64	128	192	256
Medium-complexity voice	12	21	42	96	138	192
High-complexity voice	10	14	28	60	88	120

Q. How many conferences do the PVDM3 support?

A. The PVDM3s can support:

- Up to 96 G.711 conferences
- Up to 42 G.729/G.729A/G.722 conferences
- Up to 30 iLBC conferences

Q. How many conference participants do the PVDM3s support?

A. The PVDM3s can support:

- Up to 64 participants per G.711 conference
- Up to 32 participants per G.729/G.729A/G.722/iLBC conference

Q. How many secure conference participants do the PVDM3s support?**A.** A. The PVDM3s can support:

- Up to 8 participants per G.711/G.727A/G.722/iLBC

Q. Are the PVDM3 modules field-upgradable?**A.** Yes. PVDM3s connect through a dual-inline-memory-module (DIMM) slot on the motherboard. They are easy to plug in or remove. However, please note that you must shut down the router and take the motherboard out to plug them in or remove them. Please refer to your service contract warranty information, or contact the Cisco Technical Assistance Center (TAC) before you perform these tasks.**Q. Are the PVDM3 modules hot-swappable?****A.** No. The router must be shut down to insert or remove a PVDM3.**Q. Can I configure analog-to-digital cross-connect on the Cisco 2900 and 3900 Series platforms using PVDM3 modules?****A.** Yes. The PVDM3 modules support analog-to-digital cross-connection functions. In addition, you can cross-connect analog ports on PVDM2s with digital ports on PVDM3s, and conversely.**Q. Can I synchronize the clocks of ports that run different types of DSPs (PVDM2s and PVDM3s)?****A.** Yes. The clock-synchronization features are independent of the DSPs used.**PVDM2****Q. Do the PVDM2 modules work with the Cisco 2900 and 3900 Series platforms?****A.** Yes. You can install PVDM2 modules on the motherboard PVDM slots using special adaptor cards (PVDM2-ADPTR). You can also insert an NM-HDV2 module with PVDM2 modules into the service-module slot of the Cisco 2900 and 3900 Series platforms using the network-to-server module adaptor card (SM-NM-ADPTR).**Q. How many voice channels does each PVDM2 module support?****A.** Table 7 lists the number of voice channels supported by the PVDM2.**Table 5.** Supported Channels

Name or complexity	PVDM2-8	PVDM2-16	PVDM2-32	PVDM2-48	PVDM2-64
Low-complexity voice or transcoding	8	16	32	48	64
Medium-complexity voice or transcoding	4	8	16	24	32
High-complexity voice or transcoding	4	6	12	18	24

Q. Is there any tool to help me calculate the PVDM2 resources I need for a configuration?**A.** Yes, please refer to the DSP Calculator at: <http://www.cisco.com/cgi-bin/Support/DSP/dsp-calc.pl>.**Q. Is the PVDM2 field-upgradable?****A.** Yes. The PVDM2 connects to the host through an 80-pin single-inline-memory-module (SIMM) interface. It is easily plugged in or removed.**Q. Is the PVDM2 hot-swappable?****A.** No. The router must be shut down to insert or remove a PVDM2.

Q. Can conferencing, transcoding and voice calls be supported on a single DSP?

A. No. Conferencing requires a dedicated DSP resource. If a DSP is assigned for a conferencing session, it cannot be used for transcoding or voice- calls at the same time. Transcoding and voice calls can share the resources of a single DSP, however. Note that conferencing needs a dedicated DSP, but not a dedicated PVDM2 module. For example, the PVDM2-64 contains 4 DSPs; if you use one of them for conferencing, the other three can be used for other purposes.

Q. Do the PVDM2 modules work with the Cisco 2900 and 3900 Series platforms?

A. Yes. You can install PVDM2 modules on the motherboard using special PVDM adaptor cards (PVDM2-ADPTR). You can insert the existing NM-HDV2 modules with PVDM2s into the service-module slots of the Cisco 2900 and 3900 Series platforms using network adaptor cards (SM-NM-ADPTR).

Q. Which Cisco access routers or voice network modules support the PVDM2? Which Cisco IOS Software releases and feature sets does the PVDM2 require?

A. The PVDM2s are supported in the motherboard PVDM slots of the Cisco 2800 and 3800 Series platforms in all releases available on these platforms, in IP Voice and higher images. The PVDM2s are additionally supported in the NM-HDV2, NM-HDV2-1T1/E1 and NM-HDV2-2T1/E1 network modules starting with Cisco IOS Software Release 12.3(7)T, in classic images IP Plus and higher, and in the cross-platform images in IP Voice and higher. The NM-HDV2 network modules are supported on the Cisco 2600XM and 3700 Series multi-service access platforms as well as on the Cisco 2800 and 3800 Series platforms.

Q. Does the PVDM2 support echo cancellation?

A. Yes. The PVDM2 supports echo cancellation with a 64-ms tail length, compliant with ITU-T G.168.

For More Information

For more information about the Cisco High-Density Packet Voice Digital Signal Processor Module, please visit http://www.cisco.com/en/US/products/hw/modules/ps3115/prod_module_series_home.html.



Americas Headquarters
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San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

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