Cisco Fourth Generation 1-, 2-, 4-, and 8-Port T1/E1 Multiflex Trunk Voice/WAN Network Interface Modules and Digital Signal Processor (DSP) Modules

T1/E1 Network Interface Module (NIM) Q&A

Q. What are the different voice T1/E1 cards available on the Cisco$^{®}$ 4451-X Integrated Services Router (ISR)?

A. The cards are described in Table 1.

Table 1.   Cisco T1/E1 Network Interface Modules

Part Number	Description
NIM-1MFT-T1/E1	1-port multi-flex trunk voice/clear-channel data T1/E1 module
NIM-2MFT-T1/E1	2-port multi-flex trunk voice/clear-channel data T1/E1 module
NIM-4MFT-T1/E1	4-port multi-flex trunk voice/clear-channel data T1/E1 module
NIM-8MFT-T1/E1	8-port multi-flex trunk voice/clear-channel data T1/E1 module
NIM-1CE1T1-PRI	1-port multi-flex trunk voice/channelized data T1/E1 module
NIM-2CE1T1-PRI	2-port multi-flex trunk voice/channelized data T1/E1 module
NIM-8CE1T1-PRI	8-port multi-flex trunk voice/channelized data T1/E1 module

Q. How do the NIM cards differ from the voice/WAN interface card 3 (VWIC3)?

A. The NIM cards are supported only on the Cisco 4451-X ISRs. These are the next-generation form factor of the Ethernet High-Speed WAN Interface Card (EHWIC) modules.

Q. How many NIM multi-flex trunk (MFT) cards can I install in a Cisco 4451-X ISR?

A. You can install up to three NIM MFT cards in the NIM slots on the 4451-X.

Q. Can I use the Packet Voice Digital Signal Processor Module (PVDM3) DSPs with the NIM MFT modules?

A. No, you cannot use PVDM3 DSP with the NIM MFT modules.

Q. What DSPs can I use with the NIM MFT Modules?

A. The NIM MFT modules use PVDM4 DSPs.

Q. What features are supported on the NIM MFT modules?

A. NIM MFT modules have complete feature parity with the VWIC3 MFT modules. Table 2 lists the different features supported.

Table 2.   Features Supported on the Cisco NIM MFT Modules

Part Number	Number of Ports	Clear-Channel Data	T1 and E1 Support	Voice Support	Channelized Data Support	Unstructured E1/G.703 Support
NIM-1MFT-T1/E1	1	Yes	Yes	Yes	No	No
NIM-2MFT-T1/E1	2	Yes	Yes	Yes	No	No
NIM-4MFT-T1/E1	4	Yes	Yes	Yes	No	No

Part Number	Number of Ports	Clear-Channel Data	T1 and E1 Support	Voice Support	Channelized Data Support	Unstructured E1/G.703 Support
NIM-8MFT-T1/E1	8	Yes	Yes	Yes	No	No
NIM-1CE1T1-PRI	1	Yes	Yes	Yes	Yes	Yes
NIM-2CE1T1-PRI	2	Yes	Yes	Yes	Yes	Yes
NIM-8CE1T1-PRI	8	Yes	Yes	Yes	Yes	Yes

Q. Can Cisco NIM MFT T1/E1 modules support T1 and E1 ports on the same 2- or 4- port card?

A. No, all ports can support T1 and E1, but all ports must be of the same type on the same card.

Q. What version of Cisco IOS® Software is required for supporting the Cisco NIM MFT cards, and what are the Cisco IOS Software license requirements?

A. The Cisco 1-, 2-, 4-, and 8-port NIM cards are supported only on the Cisco 4451-X ISR. The modules are supported only with Cisco IOS XE 3.9.1.

Data applications require a minimum of the IP Base Technology Package, and voice applications require a minimum of the Unified Communications Technology Package.

Q. Can the 2-, 4-, and 8-port NIMs support different clocking domains?

A. When the 2-, 4-, or 8-port NIM is used in data only, each port can connect to a different clocking domain, for example, when two different T1/E1 carriers are used. When the NIM is used for voice applications, all voice T1/E1s have to be synchronized to a single clock source and any difference in clocks risk clock slips or interface flaps. When the NIM is used for mixed data and voice applications, each data port can use an independent clock, and the voice ports can use a clock source independent from the data ports.

PVDM4

Q. What are PVDM4 DSPs?

A. The PVDM4 DSP modules are the fourth-generation DSP modules that are supported only on the 4451-X ISR. DSPs are required for time-division multiplexing (TDM) services and for IP services such as conferencing and transcoding. PVDM4 is used with the T1/E1 NIMs for TDM voice termination.

Q. What are the different PVDM4 modules?

A. Table 3 lists the different PVDM4 models.

Table 3.   PVDM4 Models

Name	Description
PVDM4-32	32-channel, high-density, voice DSP module
PVDM4-64	64-channel, high-density, voice DSP module
PVDM4-128	128-channel, high-density, voice DSP module
PVDM4-256	256-channel, high-density, voice DSP module

Q. What codecs do the PVDM4 modules support?

A. Table 4 lists supported codecs.

Table 4.   Supported Codecs

High-Complexity Codecs	Medium-Complexity Codecs	Low-Complexity Codecs
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, Clear-Channel and Fax and Modem Pass-Through

Q. Where are the PVDM4 DSPs installed?

A. Unlike previous generations of PVDM2 and PVDM3 DSP modules, the PVDM4 modules are installed directly on the T1/E1 NIM. Depending on the number of channels required, the appropriate DSP module is installed on the NIM.

For IP services such as transcoding and conferencing, the PVDM4 DSP module can be installed on the motherboard of the 4451-X ISR platform.

Q. Do PVDM4 DSPs have feature parity with the PVDM3 DSPs?

A. Yes, all features are supported on the PVDM4 DSPs with the exception of video conferencing and video transcoding. Video is not enabled on the PVDM4 DSPs.

Q. Are PVDM3 modules supported on the 4451-X ISRs?

A. No, the 4451-X ISRs use a different DSP module slot on the motherboard and only PVDM4 modules are supported.

Q. Can I replace a PVDM3 with the PVDM4 in Cisco 2900 and 3900 Series platforms?

A. No, the PVDM4 modules are only supported on the Cisco 4451-X ISR platform.

Q. How many voice sessions does each PVDM4 module support?

A. Table 5 lists the maximum number of supported voice channels on each PVDM3 module.

Table 5.   Supported Channels

Complexity	PVDM4-32	PVDM4-64	PVDM4-128	PVDM4-256
Low-Complexity Voice	32	64	128	256
Medium-Complexity Voice	24	48	96	192
High-Complexity Voice	16	32	64	128

Q. How many conferences can the PVDM4 support?

A. The PVDM4s can support:

- Up to 88 G.711 conferences

- Up to 42 G.729, G.729A, and G.722 conferences

- Up to 32iLBC conferences

Q. How many conference participants can the PVDM4s support?

A. The PVDM4s can support:

- Up to 64 participants per G.711 conference

- Up to 32 participants per G.729, G.729A, G.722, and iLBC conference

Q. How many secure conference participants can the PVDM4s support?

A. The PVDM4s can support:

- Up to eight participants per G.711, G.729A, G.722, and iLBC

Q. Are the PVDM4 modules field-upgradable?

A. Yes. PVDM4 modules are field upgradable.

Q. Are the PVDM4 modules hot-swappable?

A. There are two places where PVDM4 DSPs are installed. For TDM services, the DSP is installed on the T1/E1 NIM. Since the NIMs support online insertion and removal (OIR) they can be removed without powering down the 4451-X ISR, and the DSPs on the NIM can be removed. For IP services, the DSP is installed on the motherboard of the 4451-X ISR. The router must be shut down to insert or remove a PVDM4 on the motherboard.

For More Information

For more information on the Cisco 4451-X ISR visit
http://www.cisco.com/en/US/prod/collateral/routers/ps10906/ps12522/ps12626/qa_c67-728261.html.