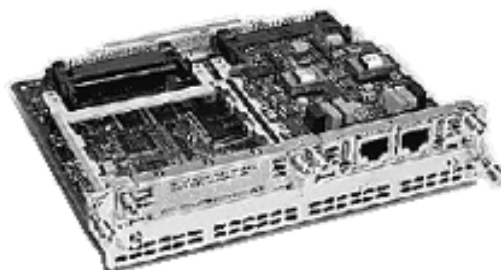


Low Density Voice/Fax Network Modules for the Cisco 2600, 3600 and 3700 Series Routers

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Cisco 2600, 3600, and 3700 low density voice/fax network modules provide enterprises, managed service providers and service providers the ability to directly connect the PSTN and legacy telephony equipment to existing Cisco 2600, Cisco 3600, and Cisco 3700 routers. This provides immediate multiservice advantages, such as telephony toll bypass, new packet telephony applications, and full gateway integration within a Cisco AVVID architecture.

Figure 1 NM-2V Module with One Two-Port FXO VIC with battery reversal detection and Caller ID support (VIC-2FXO-M1)



The low density voice/fax network modules for the Cisco 2600, 3600, and 3700 series multiservice access routers enable packet voice technologies including VoIP (H.323, MGCP and SIP), VoFR and VoATM (AAL5). Cisco voice solutions provide the means for integrating both voice and data within a single network allowing users to take advantage of services, such as toll-bypass, without sacrificing voice quality. This combination of voice solutions leverages the Cisco proven track record of being able to effectively handle time-sensitive traffic, such as Systems Network Architecture (SNA) over IP networks. Cisco IOS® software also incorporates built-in quality-of-service (QoS) features along with standards-based encapsulation providing efficient direct transport of both voice and fax over IP, Frame Relay and ATM networks. These Cisco IOS solutions enable time-sensitive voice traffic to be moved across even low-bandwidth WAN connections with the priority and quality voice/fax demands. Transporting voice over IP networks continues to provide transport flexibility since IP can be routed across a multitude of WAN technologies (leased lines, Frame Relay, and ATM) along with providing direct connectivity to the desktop.

The low density voice/fax network modules slide into Cisco 2600, 3600, and 3700 network module slots and contain either one or two voice interface card (VIC) slots. The VICs are daughter cards that slide into the voice/fax network modules and provide the interface to the telephony equipment and the PSTN. Just as the Cisco WAN interface cards

can be swapped with other WAN interface cards, the Cisco VICs can be deployed interchangeably with other VICs in the voice/fax network modules. This built-in flexibility and investment protection are key reasons for the world-wide popularity of Cisco modular branch office router products.

VICs currently available include two-port foreign exchange station (FXS), direct inward dial (DID), foreign exchange office (FXO), Centralized Automated Message Accounting (CAMA) and E&M analog interface cards. Also available are a two-port ISDN Basic Rate Interface (BRI) digital interface card providing no phantom power and a two-port ISDN Basic Rate Interface (BRI) digital interface card providing -48V phantom power. These cards cover the entire range of analog connectivity options along with user side Q.931 and QSIG digital BRI connections (see chart). A Cisco 2600 series or 3620 can house one voice/fax module that contains up to two VICs, a Cisco 3640 can house up to three modules with up to a total of six VICs, and the 3660 holds up to six network modules providing a maximum of 24 analog voice ports. In addition, a Cisco 3725 can house two voice/fax modules with a total of four VICs and a Cisco 3745 can house up to four modules with a total of eight VICs.

These low density/fax network modules also provide the gateway to Cisco AVVID architectures for calls to and from the PSTN and legacy telephony equipment (including PBXs, analog telephones, fax machines and key systems). Users can deploy networks which leverage investments in existing legacy telephony equipment while also deploying and integrating IP telephony immediately or in the future. These network modules enable users to operate at any point on the voice, video & data integrated infrastructure spectrum while incrementally adding connections to both legacy telephony and IP telephony on these networks.

Module/VIC	Description
NM-1V	One voice/fax interface card slot network module
NM-2V	Two voice/fax interface card slot network module
VIC-2FXS	Two-port FXS voice/fax interface card
VIC-2FXO	Two-port FXO voice/fax interface card [also see VIC-2FXO-M1]
VIC-2E/M	Two-port E&M voice/fax interface card
VIC-2FXO-EU	Two-port FXO voice/fax interface card (for Europe) [also see VIC-2FXO-M2]
VIC-2FXO-M1	Two-port FXO voice/fax interface card with battery reversal detection and caller ID support (for US, Canada and others) [enhanced version of the VIC-2FXO]
VIC-2FXO-M2	Two-port FXO voice/fax interface card with battery reversal detection and caller ID support (for Europe) [enhanced version of the VIC-2FXO-EU]
VIC-2FXO-M3	Two-port FXO voice/fax interface card (for Australia)
VIC-2BRI-S/T-TE	Two-port BRI voice/fax interface card (terminal side)
VIC-2BRI-NT/TE	Two-port BRI voice/fax interface card (network and terminal side)
VIC-2DID	Two-port DID (direct inward dial) voice/fax interface card
VIC-2CAMA	Two-port CAMA trunk interface card

Table 1 Cisco Voice Interface Card Applications

VIC Type	Application
VIC-2FXS	Use to connect directly to phones, fax machines, and key systems (generates battery polarity reversal with IOS Plus 12.1.2T and later and generates Caller ID using IOS Plus 12.1.3T or later).
VIC-2FXO	Use to connect to PBX or key system and to provide off-premise connections
VIC-2E/M	Use to connect to PBX or key system trunk lines
VIC-2FXO-EU	Use to connect to PBX or key system and to provide off-premise connections in Europe
VIC-2FXO-M1	Use to connect to PBX or key system and to provide off-premise connections in the U.S., Canada and other countries. Includes support for battery polarity reversal detection and Caller ID (requires Cisco IOS Plus 12.1.2T and later and supports Caller ID using Cisco IOS Plus 12.1.3T or later).
VIC-2FXO-M2	Use to connect to PBX or key system and to provide off-premise connections in Europe. Includes support for battery polarity reversal detection and Caller ID (requires Cisco IOS Plus 12.1.2T or later for battery reversal and supports Caller ID using Cisco IOS Plus 12.1.3T or later)
VIC-2FXO-M3	Use to connect to PBX or key system and to provide off-premise connections in Australia
VIC-2BRI-S/T-TE	Use to connect to PBX or key system and to provide off-premise connections (ISDN voice BRI)
VIC-2BRI-NT/TE	Use to connect as network side to PBX or key system and to provide off-premise connections (ISDN voice BRI)
VIC-2DID	Use to provide off-premise direct-inward-dial connection to CO. Serves only incoming calls from the PSTN. Supports caller ID.
VIC-2CAMA	Use to connect to CAMA trunk to provide E-911 service (North America only)

Feature	Benefit
Voice/Fax over IP	Voice and fax traffic are transport independent, because IP traffic at Layer 3 can travel over any Layer 1 or Layer 2 media, including ISDN, leased lines, serial connections, Frame Relay, Ethernet, Token Ring, and Asynchronous Transfer Mode (ATM).
Voice/Fax over Frame Relay	Applications requiring voice and fax traffic to be routed directly over Frame Relay networks will take advantage of FRF.11 and FRF.12 VoFR and fragmentation standards. This solution also uses features found only in Cisco IOS software for maintaining voice quality. VoIP can also be transported over FR.
Voice over ATM	Transport voice directly over ATM networks using AAL 5 encapsulation. Leverages existing ATM networks as a direct transport method for voice. VoATM requires ATM interfaces such as T1/E1 ATM, IMA, DS3/E3 or OC-3, or DSL WICs. VoIP can also be transported over ATM.
Connection Trunk	Creates a permanent tie-line replacement structure (digital-to-digital, digital-to-analog, or analog-to-analog capabilities).
LVBO (Local Voice Busy-Out)	Automatically busy out any desired voice trunk line to a PBX or PSTN when a direct WAN or LAN connection to the router is down. Also, busy out a far end trunk connection when configured for Connection Trunk.
Caller ID Support	Per-port configurable caller ID to phones connected to analog FXS voice ports using per call un-blocking if desired. Also provide caller ID over analog FXO and DID voice interfaces. Interoperates with analog phones, PSTNs, PBXs, H.323 terminals (i.e. Microsoft Netmeeting), Cisco Call Manager and IP phones.
PSTN Fallback	Uses Service Assurance Agent (SAA) to determine latency, delay and jitter and provide real-time ICPIF calculations before establishing a call across an IP infrastructure. SAA packets emulate voice packets receiving the same priority as voice throughout the entire network. A superior method to data and ping packets for determining congestion levels.
Robust Router-Based Voice Gateway Solution	A single device solution, which reduces management costs, minimizes latency, and has extremely low failure rates, compares favorably with most other voice over IP vendors' PC-based solutions. These solutions still require a LAN router and, therefore, result in not only increased management expenses but also higher PC failure rates.
Modular Architecture	Support any combination of voice and data within a single platform. Allows users to add functionality at any time after deployment.
Voice and Fax over Same Port	Ports can be used for both voice and fax traffic--no dedicated ports are required.
Works with Existing Phones, Faxes, PBXs, and Key Systems	No user retraining is required.
H.323 v3/v2/v1 Compatibility	The Cisco voice/fax modules are interoperable with numerous emerging voice and videoconferencing applications, such as Microsoft NetMeeting, Intel Internet Phone, LAN-based IP telephony equipment, and Cisco Call Manager.
High-Performance DSP Architecture	The Cisco voice/fax modules offer extremely low latency, which is essential for high-quality voice and fax traffic; the DSP architecture also enables all critical functions to be handled in software, which allows for simple code updates, scalability, and new features.
ITU Standards G.729, G.729a/b, G.711, G.723.1, G.726 and G.728	These are standards-based compression technologies allowing transmission of voice across IP, Frame Relay and ATM. G.711 is standard 64 kbps PCM modulation using either u-law or A-law.
Advanced Quality of Service (QoS) Mechanisms	These configurable Cisco IOS features reserve appropriate bandwidth and prioritize voice and fax traffic to ensure transparent delivery of toll-quality voice and fax. They include Resource Reservation Protocol (RSVP), Queuing Techniques (such as Low Latency Queuing), IP Precedence, and DiffServ Code Points.
Compressed Real-Time Protocol (cRTP)	These Cisco IOS features offer RTP header compression and packet fragmentation techniques that allow toll-quality voice and fax transmissions over low-bandwidth (56K and 64K) WAN connections.

Feature	Benefit
Silence Suppression/Voice Activity Detection (VAD)	Bandwidth is used only when someone is speaking. During silent periods of a phone call, bandwidth is available for data traffic.
Comfort Noise Generation	To better simulate phone calls over voice networks, this feature reassures the phone user that the connection is being maintained, even when no voice packets are being transmitted.
Dial Plan Mapping	Automatic mapping of dialed phone numbers to IP addresses simplifies configuration and management.
Dual Tone Multifrequency (DTMF) Tone Processing	This feature enables access to voice-mail and Interactive Voice Response (IVR) systems.
T.30 Protocol Recognition	This feature enables real-time fax capability.
Country-Specific Signaling	This feature transparently delivers customary phone signals to users, facilitating acceptance of new technology.
Autocalling	With this feature, a destination phone can be configured to automatically ring when the handset is lifted (also known as Private Line Automatic Ring-down—PLAR).
Hunt Groups	Calls can be forwarded automatically to the first available line.
Battery Polarity Reversal Detection and Initiation	Detection of disconnect supervision and far-end answer supervision via battery polarity reversal provides a robust method of providing supervisory disconnect especially for loop start signaling on FXS and FXO interfaces (12.1(2)T and later Cisco IOS Plus images support battery polarity reversal on the VIC-2FXS, VIC-2FXO-M1 and VIC-2FXO-M2 VICs).
Supervisory Disconnect	Signalling protocols such as loop-start do not provide means for quickly detecting when the call initiation is terminated prior to call connection. Supervisory disconnect quickly makes this determination and frees valuable resources for other calls.
ISDN BRI Network Side and Phantom Power	Cisco IOS software releases 12.1.5T provide the ability to connect PBX configured as user side directly to the router. Phantom power is also provided to accommodate equipment that requires it.
CAMA trunk connection	Cisco IOS software release 12.2(11)T provides the ability to connect to analog CAMA trunk which allows E-911 services.

Software and Memory Requirements

Cisco IOS Software Version			
Product	Cisco 2600	Cisco 3600	Cisco 3700
NM-1V	11.3(4)T or later 12.0(1)T or later	11.3(1)T or later 12.0(1)T or later	12.2.(8)T or later
NM-2V	11.3(4)T or later 12.0(1)T or later	11.3(1)T or later 12.0(1)T or later	12.2.(8)T or later
VIC-2FXS	11.3(4)T or later 12.0(1)T or later	11.3(1)T or later 12.0(1)T or later	12.2.(8)T or later
VIC-2FXO	11.3(4)T or later 12.0(1)T or later	11.3(1)T or later 12.0(1)T or later	12.2.(8)T or later
VIC-2E/M ¹	11.3(4)T or later 12.0(1)T or later	11.3(1)T or later 12.0(1)T or later	12.2.(8)T or later
VIC-2FXO-EU	11.3(6)T or later 12.0(2)T or later	11.3(6)T or later 12.0(2)T or later	12.2.(8)T or later
VIC-2FXO-M1	12.1(2)T or later	12.1(2)T or later	12.2.(8)T or later
VIC-2FXO-M2	12.1(2)T or later	12.1(2)T or later	12.2.(8)T or later
VIC-2FXO-M3	11.3(6)T or later 12.0(2)T or later	11.3(6)T or later 12.0(2)T or later	12.2.(8)T or later
VIC-2BRI-S/T-TE	12.0(3)T or later	12.0(3)T or later 3660 requires 12.1.2T	12.2.(8)T or later
VIC-2BRI-NT/TE	12.1.(3)XI or later 12.1.(5)T or later	12.1.(3)XI or later 12.1.(5)T or later	12.2.(8)T or later
VIC-2DID	12.1(5)XM1 or later 12.2(2)T or later	12.1(5)XM1 or later 12.2(2)T or later	12.2.(8)T or later
VIC-2CAMA	12.2.(11)T or later	12.2.(11)T or later	12.2.(11)T or later

1. The VIC-2E/M requires Cisco IOS Plus version 11.3(6)T for on-premise connections in Australia.

Product	Software Image	Image Name	Flash Requirements	DRAM Requirements
Cisco 2600	ENTERPRISE/SNASW PLUS IPSEC 56	c2600-a3jk8s-mz	16MB	48MB
Cisco 2600	ENTERPRISE/SNASW PLUS IPSEC 3DES	c2600-a3jk9s-mz	16MB	48MB
Cisco 2600	ENTERPRISE/SNASW PLUS	c2600-a3js-mz	16MB	48MB
Cisco 2600	IP/IPX/AT/DEC/FW/IDS PLUS	c2600-do3s-mz	16MB	48MB
Cisco 2600	IP/IPX/AT/DEC PLUS	c2600-ds-mz	16MB	40MB
Cisco 2600	IP/FW/IDS PLUS IPSEC 56	c2600-ik8o3s-mz	16MB	48MB
Cisco 2600	IP PLUS IPSEC 56	c2600-ik8s-mz	16MB	40MB
Cisco 2600	IP/FW/IDS PLUS IPSEC 3DES	c2600-ik9o3s-mz	16MB	48MB
Cisco 2600	IP PLUS IPSEC 3DES	c2600-ik9s-mz	16MB	40MB
Cisco 2600	IP PLUS	c2600-is-mz	16MB	40MB
Cisco 2600	ENTERPRISE/FW/IDS PLUS IPSEC 56	c2600-jk8o3s-mz	16MB	48MB
Cisco 2600	ENTERPRISE PLUS IPSEC 56	c2600-jk8s-mz	16MB	48MB
Cisco 2600	ENTERPRISE/FW/IDS PLUS IPSEC 3DES	c2600-jk9o3s-mz	16MB	48MB
Cisco 2600	ENTERPRISE PLUS IPSEC 3DES	c2600-jk9s-mz	16MB	48MB
Cisco 2600	ENTERPRISE PLUS	c2600-js-mz	16MB	48MB
Cisco 2600	ENTERPRISE PLUS/H323 MCM	c2600-jsx-mz	16MB	64MB

Note that the default Flash is 8MB and default DRAM is 32MB on 2600 series shipments configured with Cisco IOS 12.2(1).

The Flash and DRAM requirements above are for the Cisco IOS Plus 12.2(1) release. The actual requirement may vary depending on the version of Cisco IOS software used (refer to the release notes for the version of Cisco IOS software being used for exact FLASH and DRAM requirements).

Product	Software Image	Image Name	Flash Requirements	DRAM Requirements
Cisco 3620	ENTERPRISE/SNASW PLUS IPSEC 56	c3620-a3jk8s-mz	16MB	64MB
Cisco 3620	ENTERPRISE/SNASW PLUS IPSEC 3DES	c3620-a3jk9s-mz	16MB	64MB
Cisco 3620	ENTERPRISE/SNASW PLUS	c3620-a3js-mz	16MB	64MB
Cisco 3620	IP/IPX/AT/DEC/FW/IDS PLUS	c3620-do3s-mz	16MB	64MB
Cisco 3620	IP/IPX/AT/DEC PLUS	c3620-ds-mz	16MB	48MB
Cisco 3620	IP/FW/IDS PLUS IPSEC 56	c3620-ik8o3s-mz	16MB	64MB
Cisco 3620	IP PLUS IPSEC 56	c3620-ik8s-mz	16MB	48MB

Product	Software Image	Image Name	Flash Requirements	DRAM Requirements
Cisco 3620	IP/FW/IDS PLUS IPSEC 3DES	c3620-ik9o3s-mz	16MB	64MB
Cisco 3620	IP PLUS IPSEC 3DES	c3620-ik9s-mz	16MB	48MB
Cisco 3620	IP PLUS	c3620-is-mz	16MB	48MB
Cisco 3620	ENTERPRISE/FW/IDS PLUS IPSEC 56	c3620-jk8o3s-mz	16MB	64MB
Cisco 3620	ENTERPRISE PLUS IPSEC 56	c3620-jk8s-mz	16MB	64MB
Cisco 3620	ENTERPRISE/FW/IDS PLUS IPSEC 3DES	c3620-jk9o3s-mz	16MB	64MB
Cisco 3620	ENTERPRISE PLUS IPSEC 3DES	c3620-jk9s-mz	16MB	64MB
Cisco 3620	ENTERPRISE PLUS	c3620-js-mz	16MB	64MB
Cisco 3620	ENTERPRISE PLUS/H323 MCM	c3620-jsx-mz	16MB	64MB

Note that the default Flash is 8MB and default DRAM is 32MB on 3620 series shipments configured with Cisco IOS 12.2(1).

The Flash and DRAM requirements above are for the Cisco IOS Plus 12.2(1) release. The actual requirement may vary depending on the version of Cisco IOS software used (refer to the release notes for the version of Cisco IOS software being used for exact FLASH and DRAM requirements).

Product	Software Image	Image Name	Flash Requirements	DRAM Requirements
Cisco 3640	ENTERPRISE/SNASW PLUS IPSEC 56	c3640-a3jk8s-mz	16MB	64MB
Cisco 3640	ENTERPRISE/SNASW PLUS IPSEC 3DES	c3640-a3jk9s-mz	16MB	64MB
Cisco 3640	ENTERPRISE/SNASW PLUS	c3640-a3js-mz	16MB	64MB
Cisco 3640	IP/IPX/AT/DEC/FW/IDS PLUS	c3640-do3s-mz	16MB	64MB
Cisco 3640	IP/IPX/AT/DEC PLUS	c3640-ds-mz	16MB	48MB
Cisco 3640	IP/FW/IDS PLUS IPSEC 56	c3640-ik8o3s-mz	16MB	64MB
Cisco 3640	IP PLUS IPSEC 56	c3640-ik8s-mz	16MB	48MB
Cisco 3640	IP/FW/IDS PLUS IPSEC 3DES	c3640-ik9o3s-mz	16MB	64MB
Cisco 3640	IP PLUS IPSEC 3DES	c3640-ik9s-mz	16MB	48MB
Cisco 3640	IP PLUS	c3640-is-mz	16MB	48MB
Cisco 3640	ENTERPRISE/FW/IDS PLUS IPSEC 56	c3640-jk8o3s-mz	16MB	64MB
Cisco 3640	ENTERPRISE PLUS IPSEC 56	c3640-jk8s-mz	16MB	64MB
Cisco 3640	ENTERPRISE/FW/IDS PLUS IPSEC 3DES	c3640-jk9o3s-mz	16MB	64MB
Cisco 3640	ENTERPRISE PLUS IPSEC 3DES	c3640-jk9s-mz	16MB	64MB

Product	Software Image	Image Name	Flash Requirements	DRAM Requirements
Cisco 3640	ENTERPRISE PLUS	c3640-js-mz	16MB	64MB
Cisco 3640	ENTERPRISE PLUS/H323 MCM	c3640-jsx-mz	16MB	64MB

Note that the default Flash is 8MB and default DRAM is 32MB on 3640 series shipments configured with Cisco IOS 12.2(1).

The Flash and DRAM requirements above are for the Cisco IOS Plus 12.2(1) release. The actual requirement may vary depending on the version of Cisco IOS software used (refer to the release notes for the version of Cisco IOS software being used for exact FLASH and DRAM requirements).

Product	Software Image	Image Name	Flash Requirements	DRAM Requirements
Cisco 3660	ENTERPRISE/SNASW PLUS IPSEC 56	c3660-a3jk8s-mz	16MB	64MB
Cisco 3660	ENTERPRISE/SNASW PLUS IPSEC 3DES	c3660-a3jk9s-mz	16MB	64MB
Cisco 3660	ENTERPRISE/SNASW PLUS	c3660-a3js-mz	16MB	64MB
Cisco 3660	IP/IPX/AT/DEC/FW/IDS PLUS	c3660-do3s-mz	16MB	64MB
Cisco 3660	IP/IPX/AT/DEC PLUS	c3660-ds-mz	16MB	64MB
Cisco 3660	IP/FW/IDS PLUS IPSEC 56	c3660-ik8o3s-mz	16MB	64MB
Cisco 3660	IP PLUS IPSEC 56	c3660-ik8s-mz	16MB	64MB
Cisco 3660	IP/FW/IDS PLUS IPSEC 3DES	c3660-ik9o3s-mz	16MB	64MB
Cisco 3660	IP PLUS IPSEC 3DES	c3660-ik9s-mz	16MB	64MB
Cisco 3660	IP PLUS	c3660-is-mz	16MB	64MB
Cisco 3660	ENTERPRISE/FW/IDS PLUS IPSEC 56	c3660-jk8o3s-mz	16MB	64MB
Cisco 3660	ENTERPRISE PLUS IPSEC 56	c3660-jk8s-mz	16MB	64MB
Cisco 3660	ENTERPRISE/FW/IDS PLUS IPSEC 3DES	c3660-jk9o3s-mz	16MB	64MB
Cisco 3660	ENTERPRISE PLUS IPSEC 3DES	c3660-jk9s-mz	16MB	64MB
Cisco 3660	ENTERPRISE PLUS	c3660-js-mz	16MB	64MB
Cisco 3660	ENTERPRISE PLUS/H323 MCM	c3660-jsx-mz	16MB	64MB

Note that the default Flash is 8MB and default DRAM is 32MB on 3660 series shipments configured with Cisco IOS 12.2(1).

The Flash and DRAM requirements above are for the Cisco IOS Plus 12.2(1) release. The actual requirement may vary depending on the version of Cisco IOS software used (refer to the release notes for the version of Cisco IOS software being used for exact FLASH and DRAM requirements).

Product	Software Image	Image Name	Flash Requirements	DRAM Requirements
Cisco 3725	IP/IPX/AT/FW/IDS PLUS	c3725-bino3s-mz	32MB	128MB
Cisco 3725	IP/IPX/AT PLUS	c3725-bins-mz	32MB	128MB
Cisco 3725	IP/FW/IDS PLUS IPSEC 3DES	c3725-ik9o3s-mz	32MB	128MB
Cisco 3725	IP PLUS IPSEC 3DES	c3725-ik9s-mz	32MB	128MB
Cisco 3725	IP PLUS	c3725-is-mz	32MB	128MB
Cisco 3725	ENTERPRISE/FW/IDS PLUS IPSEC 3DES	c3725-jk9o3s-mz	32MB	128MB
Cisco 3725	ENTERPRISE PLUS IPSEC 3DES	c3725-jk9s-mz	32MB	128MB
Cisco 3725	ENTERPRISE PLUS	c3725-js-mz	32MB	128MB
Cisco 3725	ENTERPRISE PLUS/H323 MCM	c3725-jsx-mz	32MB	128MB

Note that the default Flash is 32MB and default DRAM is 128MB on 3725 series shipments configured with Cisco IOS 12.2(8)T.

The Flash and DRAM requirements above are for the Cisco IOS Plus 12.2(8)T release. The actual requirement may vary depending on the version of Cisco IOS software used (refer to the release notes for the version of Cisco IOS software being used for exact FLASH and DRAM requirements).

Product	Software Image	Image Name	Flash Requirements	DRAM Requirements
Cisco 3745	IP/IPX/AT/FW/IDS PLUS	c3745-bino3s-mz	32MB	128MB
Cisco 3745	IP/IPX/AT PLUS	c3745-bins-mz	32MB	128MB
Cisco 3745	IP/FW/IDS PLUS IPSEC 3DES	c3745-ik9o3s-mz	32MB	128MB
Cisco 3745	IP PLUS IPSEC 3DES	c3745-ik9s-mz	32MB	128MB
Cisco 3745	IP PLUS	c3745-is-mz	32MB	128MB
Cisco 3745	ENTERPRISE/FW/IDS PLUS IPSEC 3DES	c3745-jk9o3s-mz	32MB	128MB
Cisco 3745	ENTERPRISE PLUS IPSEC 3DES	c3745-jk9s-mz	32MB	128MB
Cisco 3745	ENTERPRISE PLUS	c3745-js-mz	32MB	128MB
Cisco 3745	ENTERPRISE PLUS/H323 MCM	c3745-jsx-mz	32MB	128MB

Note that the default Flash is 32MB and default DRAM is 128MB on 3745 series shipments configured with Cisco IOS 12.2(8)T.

The Flash and DRAM requirements above are for the Cisco IOS Plus 12.2(8)T release. The actual requirement may vary depending on the version of Cisco IOS software used (refer to the release notes for the version of Cisco IOS software being used for exact FLASH and DRAM requirements).

Specifications

NM-1V	One voice/fax interface card slot network module
Cisco IOS Requirement	11.3(1)T or later for Cisco 3600 11.3(4)T or later for Cisco 2600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-02489-01
FCC Specifications	FCC Class B device
Spare	NM-1V=
Mean Time between Failures (MTBF)	946,423 hours
Requires One VIC	VIC-2FXS 800-02493-01 VIC-2FXO 800-02495-01 VIC-2E/M 800-02497-01 VIC-2FXO-EU 800-03639-01 VIC-2FXO-M1 800-05298-01 VIC-2FXO-M2 800-05920-01 VIC-2FXO-M3 800-04581-01 VIC-2BRI-S/T-TE 800-03803-1 VIC-2BRI-NT/TE 800-07272-01 VIC-2DID 800-06487-01 VIC-2CAMA 800-18443-01

NM-2V	Two voice/fax interface card slot network module
Cisco IOS Requirement	11.3(1)T or later for Cisco 3600 11.3(4)T or later for Cisco 2600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-02491-01
FCC Specifications	FCC Class B device
Spare	NM-2V=
MTBF	755,717 hours
Requires at Least One VIC (maximum of two)	VIC-2FXS 800-02493-01 VIC-2FXO 800-02495-01 VIC-2E/M 800-02497-01 VIC-2FXO-EU 800-03639-01 VIC-2FXO-M1 800-05298-01 VIC-2FXO-M2 800-05920-01 VIC-2FXO-M3 800-04581-01 VIC-2BRI-S/T-TE 800-03803-1 VIC-2BRI-NT/TE 800-07272-01 VIC-2DID 800-06487-01 VIC-2CAMA 800-18443-01

VIC-2FXS	Two-port FXS voice/fax interface card
Interface Type	Foreign exchange station
Cisco IOS Requirement	11.3(1)T or later for Cisco 3600 11.3(4)T or later for Cisco 2600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-02493-01
Compliance	FCC Class B device, CE
Safety Conformance	UL1950
Spare	VIC-2FXS=
Address Signaling Formats	In-band DTMF Out-of-band pulse (10/20 pps)
Signaling Formats	Loop start, ground start
Ringing Tone	Configurable for different country requirements
Ringing Voltage	<45 Vrms at 5 REN at 25 Hz (configurable frequency)
Ringing Frequencies	20 Hz, 50 Hz
Physical Connector	RJ-11
Number of Connectors/Ports	Two
MTBF	2,248,909 hours

VIC-2FXO	Two-port FXO voice/fax interface card
Interface Type	Foreign exchange office
Cisco IOS Requirement	11.3(1)T or later for Cisco 3600 11.3(4)T or later for Cisco 2600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-02497-01
Compliance	FCC Class B device, CE
Safety Conformance	UL1950
Spare	VIC-2FXO=
Signaling Formats	Loop start, ground start
Address Signaling Formats	In-band DTMF Out-of-band pulse (10/20 pps)
Tone Disconnect Supervision	Call disconnect on progress tone of less than 600 Hz
Power Interrupt Disconnect	Call disconnect on power interrupt of > 600 msec
Physical Connector	RJ-11
Number of Connectors/Ports	Two
MTBF	2,302,609 hours

VIC-2E/M	Two-port E&M voice/fax interface card
Interface Type	For PBX trunking
Cisco IOS Requirement	11.3(1)T or later for Cisco 3600 11.3(4)T or later for Cisco 2600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-02497-01
Compliance	FCC Class B device, CE
Safety Conformance	UL 1950
Spare	VIC-2E/M=
Address Signaling Formats	In-band DTMF Out-of-band pulse (10/20 pps)
Signaling Formats	Immediate, delay dial, wink start
Signaling Types	I, II, III, and V
E-Lead Current Limit	100 mA
M-Lead Sensitivity	> 3 mA
Pulse Distortion	< 2%
Physical Connector	4 wire/2 wire
Number of Connectors/Ports	Two
MTBF	1,943,521 hours

VIC-2FXO-EU	Two-port FXO voice/fax interface card (for Europe)
Interface Type	Foreign exchange office
Cisco IOS Requirement	11.3(6)T or later for Cisco 3600 or 12.0(2)T or later for Cisco 3600 11.3(6)T or later for Cisco 2600 or 12.0(2)T or later for Cisco 3600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-03639-01
Compliance	CE, CTR-21
Safety Conformance	UL1950
Spare	VIC-2FXO-EU=
Signaling Formats	Loop start
Address Signaling Formats	In-band DTMF Out-of-band pulse (10/20 pps)
Tone Disconnect Supervision	Call disconnect on progress tone of less than 600 Hz
Power Interrupt Disconnect	Call disconnect on power interrupt of > 600 msec
Physical Connector	RJ-11
Number of Connectors/Ports	Two
MTBF	1,010,264 hours

VIC-2FXO-M1	Two-port FXO voice/fax interface card with battery reversal detection and caller ID (for US, Canada, Japan and other countries)
Interface Type	Foreign exchange office
Cisco IOS Requirement	12.1.2T or later for Cisco 3600 and 2600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-05298-01
Compliance	FCC Class B device, CE
Safety Conformance	UL1950
Spare	VIC-2FXO-M1=
Signaling Formats	Loop start, ground start
Address Signaling Formats	In-band DTMF Out-of-band pulse (10/20 pps)
Tone Disconnect Supervision	Call disconnect on progress tone of less than 600 Hz
Battery Polarity Reversal Detection	Detection of disconnect supervision and far-end answer supervision via battery polarity reversal
Power Interrupt Disconnect	Call disconnect on power interrupt of > 600 msec
Physical Connector	RJ-11
Number of Connectors/Ports	Two
MTBF	546,560 hours (using Bellcore model)

VIC-2FXO-M2	Two-port FXO voice/fax interface card with battery reversal detection and caller ID support (for Europe)
Interface Type	Foreign exchange office
Cisco IOS Requirement	12.1.2T or later for Cisco 3600 and 2600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-05920-01
Compliance	CE, CTR-21
Safety Conformance	UL1950
Spare	VIC-2FXO-M2=
Signaling Formats	Loop start
Address Signaling Formats	In-band DTMF Out-of-band pulse (10/20 pps)
Tone Disconnect Supervision	Call disconnect on progress tone of less than 600 Hz
Battery Polarity Reversal Detection	Detection of disconnect supervision and far-end answer supervision via battery polarity reversal
Power Interrupt Disconnect	Call disconnect on power interrupt of > 600 msec
Physical Connector	RJ-11
Number of Connectors/Ports	Two
MTBF	656, 116 hours (using Bellcore model)

VIC-2FXO-M3	Two-port FXO voice/fax interface card (for Australia)
Interface Type	Foreign exchange office
Cisco IOS Requirement	11.3(6)T or later for Cisco 3600 or 12.0(2)T or later for Cisco 3600 11.3(6)T or later for Cisco 2600 or 12.0(2)T or later for Cisco 2600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-04581-01
Compliance	AUA TS.002, AUA TS.003
Safety Conformance	UL1950
Spare	VIC-2FXO-M3=
Signaling Formats	Loop start, ground start
Address Signaling Formats	In-band DTMF Out-of-band pulse (10/20 pps)
Tone Disconnect Supervision	Call disconnect on progress tone of less than 600 Hz
Power Interrupt Disconnect	Call disconnect on power interrupt of > 600 msec
Physical Connector	RJ-11
Number of Connectors/Ports	Two
MTBF	1,010,264 hours

VIC-2BRI-ST-TE	Two-port BRI voice/fax interface card (terminal side)
Interface Type	ISDN Basic Rate Interface
Cisco IOS Requirement	12.0(3)T or later for Cisco 3600 and 2600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-03803-01
Compliance	FCC Part 68 CS03 CTR3 TS-031 JATE Green Book
Safety Conformance	UL1950, CAN/CSA-C22.2, IEC 950, EN60950
Spare	VIC-2BRI-ST-TE=
ITU Compliance	ITU-T Q.920, Q.921, Q.930, Q.931
Interface	Four wire user side S/T
ISDN Digital Access	Basic Rate Interface (BRI) 4B+2D
Physical Connector	RJ-45
Number of Connectors/Ports	Two
MTBF	2,951,544 hours

VIC-2BRI-NT/TE	Two-port BRI voice/fax interface card (network side)
Interface Type	ISDN Basic Rate Interface
Cisco IOS Requirement	12.1(3)XI or 12.1(5)T later for Cisco 3600 and 2600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-07272-01
Compliance	FCC Part 68 CS03 CTR3 TS-031 JATE Green Book
Safety Conformance	UL1950, CAN/CSA-C22.2, IEC 950, EN60950
Spare	VIC-2BRI-NT/TE=
ITU Compliance	ITU-T Q.920, Q.921, Q.930, Q.931
Interface	Four wire user side S/T or network side NT
ISDN Digital Access	Basic Rate Interface (BRI) 4B+2D
Physical Connector	RJ-45
Number of Connectors/Ports	Two
MTBF	1,991,520 hours

VIC-2DID	Two-port DID voice/fax interface card
Interface Type	Direct inward dial trunk
Cisco IOS Requirement	12.1(5)XM1 or 12.2(2)T later for Cisco 2600/3600 12.2(8)T or later for Cisco 2691 and 3700
Cisco Part Number	800-06487-01
Compliance	FCC Class B device, CE
Safety Conformance	UL1950
Spare	VIC-2DID=
Address Signaling Formats	In-band DTMF Out-of-band pulse (10/20 pps)
Signaling Formats	Immediate, delay dial, wink start
Disconnect Supervision	Power denial (Calling Party Control, far-end disconnect)
Caller ID	On-hook transmission of FSK data
Physical Connector	RJ-11
Number of Connectors/Ports	Two
MTBF	3,270,000 hours

*European Community countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.



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