Cisco **2600-DC Series**
Modular Access Platform

Cisco Systems Extends Versatility, Integration, and Power of the Cisco 2600 Series Modular Access Platform series to Service Provider central offices and Data Communications Networks.

As part of a scalable Data Communications Network (DCN) solution, including the Cisco Catalyst® 2950G-24-DC switch, Catalyst 2924M-XL switch, Catalyst 4003-DC switch, Cisco 3662-AC/DC-CO, Cisco 3631-CO, and Cisco 2600 Series modular access platforms, the Cisco 2600 Series supports central office (CO) serial, X.25 and Internet protocol/open system interconnection (IP/OSI) interfaces for operations management in Service Provider, Inter-Exchange Carrier (IXC), and Post, Telephone and Telegraph (PTT) networks. The Cisco DCN solution supports synchronous optical network/synchronous digital hierarchy (SONET/SDH) network element (NE) connectivity for alarm monitoring and control, remote provisioning, and software download. Other operations systems network applications include local number portability and billing data collection. In addition, competitive local exchange carriers (CLECs) can use the Cisco 2600

in small point of presences (POPs) or central office colocations for digital subscriber line access multiplexers (DSLAMs), voice switches, and transmission operations networking.

New Models in Cisco 2600 DC Family: 2600XM-DC and 2691-DC

The Cisco 2600XM-DC models provides the same proven technology of the previous Cisco 2600 Series platforms, including Cisco IOS® software mainline feature support and the modularity of Network Modules (NMs), WAN Interface Cards (WICs) and Advanced Integration Modules (AIMs). The Cisco 2691-DC-U model provides the same module support as the 2600XM, increased performance (up to 70kbps), and even greater density and scalability.

The modular architecture of the Cisco 2600 Series allows interfaces to be upgraded to accommodate network expansion or changes in technology as new services and applications are deployed. Service providers can integrate the functions of multiple, separate devices into a single, compact unit, thereby reducing the complexity of managing DCN infrastructures. For example, the Cisco 2600 Series supports connectivity to legacy asynchronous and X.25 devices as well as standards-based

Figure1
Cisco 2600 Series
Modular Access Routers

IP devices, facilitating a graceful migration from legacy to next generation network elements. Driven by a powerful RISC processor, the Cisco 2600 Series provides the extra power needed to support the advanced quality of service (QoS), higher bandwidth and security features required for connecting to today's Network Operation Center (NOC) systems.

The Cisco 2600 Series meets service provider's critical physical requirements for equipment depth fitting right alongside transmission equipment on standard 12 inch deep racks, and occupying only 1RU to 2RU in height. Offered in seven base configurations supporting fixed single or dual local-area network (LAN) ports, each Cisco 2600 also includes one network module slot, two wide-area network (WAN) interface card slots and one or two advanced integration module (AIM) slots. Rear access cabling allows easy connectivity; the modular design shares a large number of modules with the Cisco 3600 and 3700 Series, permitting fast servicing of Field Replaceable Units (FRUs). DC, AC and redundant AC power supply adapter modules are also field replaceable. Network Equipment Building Standards (NEBS) Level 3/ETSI compliance is achieved when used with the Cisco 2600's optional NEBs/ETSI kit. Common Language Equipment Identification (CLEI) coding is provided for easy identification and tracking of central-office equipment. Robust network management capability for the Cisco DCN solution is achieved by using the CiscoWorks Management Software or the IE2100 appliance.

Cisco 2600 Series Chassis Options

Each of the Cisco 2610XM-DC through Cisco 2651XM DC versions supports one Network Module (NM) slot, two WAN Interface Card slots, and one AIM slot, along with one or two fixed LAN ports, one asynchronous auxiliary port and one console port. The Cisco 2691-DC-U version supports one Network Module (NM) slot, three WAN Interface Card slots, and two AIM slots, along with two fixed LAN ports, one asynchronous auxiliary port and one console port. These slots share more than 50 different modules across four Cisco product lines—the Cisco 1700 Series, the Cisco 2600 Series, the Cisco 3600 Series and the Cisco 3700 Series.

The Cisco 2600 DC Series is available in a number of base configurations:

- CISCO2610XM/11XM-DC
- CISCO2612-DC
- CISCO2620XM/21XM-DC
- CISCO2650XM/51XM-DC
- CISCO2691-DC-U

Additionally a spare DC power supply can be ordered for field upgrades or replacements:

- PWR-2600-DC= Cisco 2600/2600XM DC power supply spare
- PWR-2691-DC-U= Spare Universal Power Supply 24 to 48 volts

Refer to Table 2, Cisco 2600 Series System Specifications for detailed product information

Note: AC & RPS power supply versions are also available.

The WAN interface cards available for the Cisco 1700, 2600, 3600, 3700 platforms support a variety of serial, Integrated Services Digital Network Basic Rate Interface (ISDN BRI), and integrated CSU/DSU options for primary and backup WAN connectivity. Network modules available for the Cisco 2600 and 3700 Series support a broad range of applications, including multiservice voice/data integration, analog and ISDN dial access, and serial device

concentration. The internal Data Compression AIM for the Cisco 2600 Series off-loads the task of performing high-speed data compression from the Cisco 2600's main CPU, allowing compressed data throughput of up to 8-Mbps while preserving external interface slots for other applications.

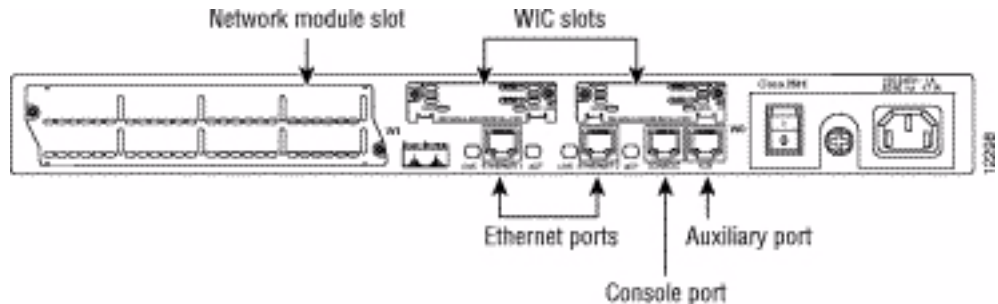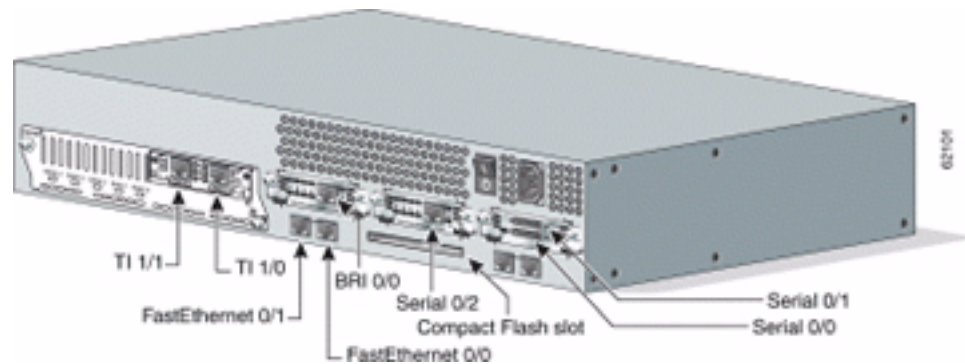**Figure 2**
Cisco 2600 Series Back Panel View (Cisco 2611XM Shown)

Figure 3
Cisco 2600 Series Back Panel View (Cisco 2691 Shown)

Solution Application Notes

What follows are two examples that illustrate the versatility of the Cisco 2600 models in a CO environment. The first example depicts a Cisco 2600 as both an Ethernet/Asynchronous/Synchronous telemetry platform, and with the new Alarm Interface Controller network module (NM-AIC-64), facilitates remote alarm monitoring and control of vital network elements. A second application example depicts the Cisco 2600 with the new Ethernet Switch network module (NM-16ESW). The Cisco 2600 have been developed to accept a myriad of modules, allowing the user to custom tailor the platform to specialized network requirements.

Example Application #1: Security—Remote Alarm Monitoring and Control

Figure 4

Security—Remote Alarm Monitoring and Control
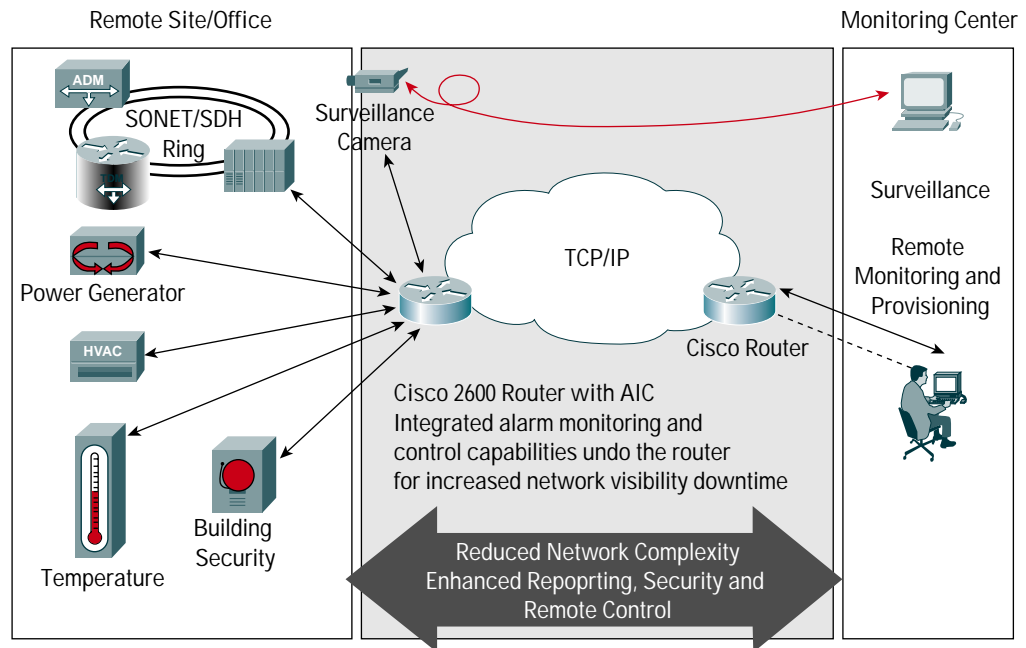
The alarm interface controller (AIC) is a network module that greatly expands the network monitoring and control capabilities of the Cisco 2600 and 3700 Series routers. The AIC functions as an integrated entity residing within the Cisco 2600 platform to provide network alarm monitoring and proactive remote control of network elements. The AIC reduces service-provider and enterprise operating expenses by facilitating an integrated solution to remote network management. This eliminates the need for a dedicated external alarm-monitoring device. Greatly simplifying network layout, monitoring, and control; resulting in lower operations, administration, maintenance, and provisioning (OAM&P) costs. The AIC is supported in Cisco IOS 12.2(8)T and later. The AIC network module supports 64 discrete alarm inputs, of which 8 of the last 64 alarm points are software-configurable to accept either analog or discrete inputs. The AIC further supports 16 control relays to facilitate the proactive remote control of network elements.

Example Application #2: Ethernet Switch Network Module

Figure 5

Ethernet Switch Network Module
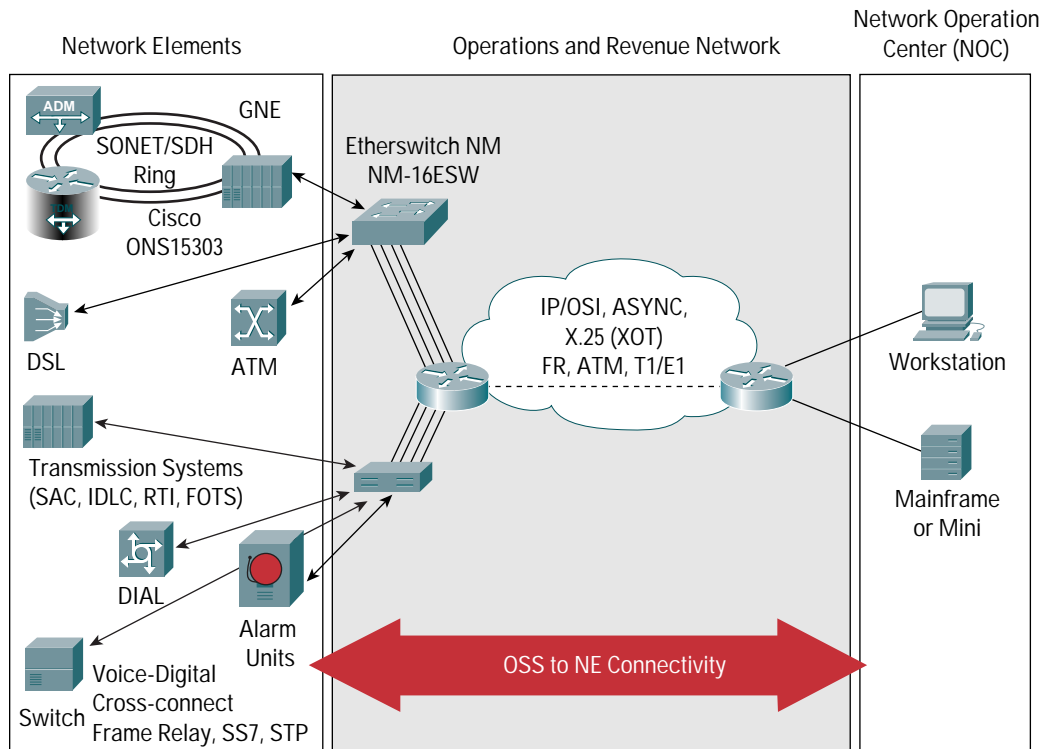
The Cisco 16-port 10/100 Ethernet Switch Network Module (NM-16ESW) is a high-density ethernet network module that provides line-rate Layer 2 switching across Ethernet ports using Cisco IOS® Catalyst Software. Features such as port autosensing, QoS and VLAN support from 802.1P and 802.1Q standards, and 802.1D Spanning Tree protocols are standard on the EtherSwitch module. The EtherSwitch offers service providers the option to integrate switching and routing in one compact platform to simplify their Operations Support Network. This combination offers ease of configuration, deployment and management while utilizing the powerful characteristics of Cisco routing and Catalyst switching features.

With an optional configuration, DC power can be provided directly from the CO to the etherswitch module and from there inline to Cisco IP Phones and Aironet Access Points and Base Stations. This solution allows for deployment of IP Telephony and wireless LANs throughout the CO without adding an AC power source.

Features and Benefits

The Cisco 2600 Series brings a cost-effective combination of versatility, integration, and power to service providers with the features listed in Table 1.

Table 1   Features and Benefits of the Cisco 2600 Series

Features	Benefits
Versatility and Investment Protection	
Modular Architecture	• Network interfaces are field-upgradable to accommodate future technologies while providing a solution to meet today's needs • Additional interfaces can be added on a "pay-as-you-grow" basis to accommodate network growth • Wide variety of interfaces and port densities for IP, ATM, Frame and TDM networks to support any Central Office environment
Broad array of WAN Interface Cards and Network Modules Shared with Cisco 1700, 3600, and 3700 Series Modular Access Platforms	• Reduces cost of maintaining inventory of Cisco 1700, 2600, 3600, and 3700 Series modular components • Lower training costs for support personnel
Advanced Integration Module Slot	• Expandability for integration of advanced services such as hardware-assisted data compression, encryption, Voice and ATM • Maximizes performance by off-loading processor intensive applications to a coprocessor • Provides expanded services, freeing the NM slot for other applications
Choice of LAN Configurations	• Meets specific Telco DCN and CO Local Area Network requirements including single and dual LAN connections for auto-sensing 10/100Mbps Ethernet, mixed Ethernet and Token Ring environments • Optional etherswitch module provides for low-density Layer 2 connectivity and optional inline power to IP Phones and Aironet Access Points.
DC and AC Power Supply Options	• Allows deployment in DC power environments such as telecommunications carrier central offices or as a managed Customer Premise Equipment (CPE) platform with an AC power supply
Service Provider/Carrier DCN-Class Performance	
High-Performance Architecture	• High-speed routing performance of up to 70,000 packets per second for maximum scalability to support more concurrent functions (Cisco 2691-DC) • Support for advanced QoS features such as the Resource Reservation Protocol (RSVP), Weighted Fair Queuing (WFQ), and IP Precedence to reduce recurring WAN costs • Support for up to 10 T1/E1 network connections • Up to 39 asynchronous or 22 synchronous connections are supported in a single Cisco 2600 enabling telemetry applications • Support for TDM traffic with drop and insert capabili.ty • AIM slot support to off-load processor intensive applications including hardware-based compression, encryption, ATM access, and Voice. • Enables security features such as data encryption, tunneling, and user authentication and authorization for virtual private network (VPN) access • Full Cisco IOS® Software Support

Table 1 Features and Benefits of the Cisco 2600 Series (Continued)

Features	Benefits
Deployed in IP networks around the world, the Cisco IOS software supports the following DCN related services:	• Full IP Routing Services including multiprotocol BGP, multi-Area ISIS and DNS • TL1 support including transport via X.25, TCP or OSI. TID Address Resolution Protocol (TARP) support and TARP Storm Avoidance support. • PPP services including WAN interface support for ISDN, Frame Relay, ATM, and X.25 • X.25 support services including X.25 switching, X.3 Asynchronous PAD, DNS for X.25 address resolution, Hunt Groups, and SVC/PVC conversion • IP to X.25 Protocol Translation • BX.25 Transport over X.25 or TCP (XOT) • Support for up to 3 OSI/IS-IS areas, per chassis, essentially providing the same capabilities as 3 separate OSI routers. • Full-featured IP and OSI routing and mediation on a single platform, including legacy X.25, and async devices support Cisco IOS Firewall feature sets provide support for advanced security features such as Context-Based Access Control (CBAC), Java blocking, denial of service protection, and audit trails • Integration of legacy networks via data link switching plus (DLSW+) and Advanced Peer-to-Peer Networking (APPN)
Simplified Management	
Common Language Equipment Identification (CLEI) Codes	• Enables easy identification and tracking of central-office equipment
Part of the Cisco DCN Stackable Solutions	• Can be stacked with LAN switches such as the Catalyst 2950G-24-DC or Cisco 3662-AC/DC-CO modular access platform
VLAN Support	• Enables inter-VLAN routing via the Cisco Inter-Switch Link (ISL) protocol with the Cisco Catalyst 2950G-24-DC and 2924M XL DC switches and the Cisco 3662-AC/DC-CO when used with the Cisco 2600XM, 2691, and Cisco IOS "Plus" feature set • Enables inter-VLAN routing via 802.1q encapsulation within the chassis using the NM-16ESW etherswitch module
Cisco Discovery Protocol (CDP) Support	• Enables a CiscoWorks network management station to automatically discover the Cisco 2600 in a network topology.
Integrated CSU/DSU, Analog Modem and NT1 Options	• Enables remote management of all CPE elements for higher network availability and lower operational costs
Support for Cisco Works and CiscoView	• Allows simplified management of all integrated and stackable components
Enhanced Setup Feature	• Context-sensitive questions guide the user through the router configuration process, allowing faster deployment
Support for Cisco AutoInstall	• Configures remote routers automatically across a WAN connection to save cost of sending technical staff to the remote site
Cisco Configuration Express Support	• Enables quick and cost-effective deployment of large installations by ordering custom-configured platforms from Cisco

Table 1 Features and Benefits of the Cisco 2600 Series (Continued)

Features	Benefits
Reliability	
Dial-on-Demand Routing	• Allows automatic backup of WAN connection in case of a primary link failure
Dual Bank Flash Memory	• Backup copy of the Cisco IOS software can be stored in Flash memory
Redundant AC Power Supply Option	• AC RPS option can be shared with other network components such as the Cisco Catalyst 2950G-24-DC Series to protect CPE network from downtime due to power failures

Cisco IOS Software

The Cisco 2600 Series a wide range of Cisco IOS features. This includes a variety of intranet, multiprotocol, QoS, and Security applications in use today. Beginning in 12.3 Mainline the Cisco 2600 Series features sets have been condensed into eight cross platform feature sets and up to nine additional special purpose feature sets.

The cross platform feature sets are:

- IP Base
- IP Voice
- Enterprise Base
- Enterprise Services
- Advanced IP Services
- Advanced Enterprise Services
- SP Services
- Advanced Security

The following Special Purpose feature sets are offered in addition to the above base feature sets:

- Enterprise/SNASw Plus IPSec 3DES
- Enterprise/SNASw Plus
- Enterprise Services
- Enterprise Plus/H.323 MCM
- Enterprise SSG (2650/51XM only)
- Voice IP to IP Voice Gateway (2600XM only)
- Voice IP to IP Voice Gateway IPSec 3DES (2600XM only)
- IP/H.323
- Telco Feature Set (2600XM only)

12.3Mainline and prior contain a legacy set of features sets including IP, IP Plus, Enterprise, and many others.

A more detailed list of features and memory requirements for specific feature sets by version can be found in the Cisco IOS release notes for the Cisco 2600 series.

NEBS Compliance

The optional NEBS Level 3/ETSI kit ensures a Cisco 2600 modular access platform meets NEBS Level 3/ETSI standards for networking equipment usually found in the central office. This kit is available for the Cisco 261x and Cisco 262x Series as a spare (ACS-2600NEBS/ETSI=). This kit also includes the 23/24 inch rack mount kit for Hendry Bays.

Regulatory Compliance

The Cisco 2600-DC module access platform conforms to a number of safety, EMI, immunity and network homologation standards. Details of the regulatory specifications are included at http://www.cisco.com/kobayashi/ Support_root.shtml.

Table 2 Cisco 2600 Series System Specifications Cisco 2600 Series System Specifications

	2612	2610/11XM	2620/21XM	2650/51XM	2691
Performance	15Kpps	20Kpps	30Kpps	40Kpps	70Kpps
Flash Memory (Default/Max)	8MB/16MB	32MB/48MB	32MB/48MB	32MB/48MB	32MB/128MB (Compact Flash)
System Memory (Default/Max)	32MB/64MB	96MB/128MB	96MB/128MB	128MB/128MB	128MB/256MB
Integrated WIC Slots	2	2	2	2	3
Onboard AIM (Internal) Slot	1	1	1	1	2
Console Port (up to 115.2 kbps)	1	1	1	1	1
Aux Port (up to 115.2 kbps)	1	1	1	1	1
Minimum Cisco IOS Release	11.3T or later and 12.0.1 mainline	12.1(14) mainline, 12.2(12) mainline (future), 12.2(8)T1or later	12.1(14) mainline, 12.2(12) mainline (future), 12.2(8)T1or later	12.1(14) mainline, 12.2(12) mainline (future), 12.2(8)T1or later	12.2(8)T1or later
Onboard LAN Ports	1 to 2 Ethernet ports 2612—1TR/1E	1 to 2 10/100 FE ports	1 to 2 10/100 FE ports	1 to 2 10/100 FE ports	2 10/100 FE ports
Redundant Power Supply	External only	External only	External only	External only	External only
Rack Mounting	Yes, 19′ and 23" options	Yes, 19′ and 23" options	Yes, 19′ and 23" options	Yes, 19′ and 23" options	Yes, 19′ and 23" options
Wall Mounting	Yes	Yes	Yes	Yes	No
Power Supply	50W Maximum (+5V,+12V, -12V) AC power supply	50W Maximum (+5V,+12V, -12V) AC power supply	50W Maximum (+5V,+12V, -12V) AC power supply	50W Maximum (+5V,+12V, -12V) AC power supply	105W Maximum (+5V,+3.3V,+12V,-12V) AC power supply

Table 2 Cisco 2600 Series System Specifications Cisco 2600 Series System Specifications (Continued)

	2612	2610/11XM	2620/21XM	2650/51XM	2691
Power Output	5V@9.5A, 12V@1.20A, -12V@0.5A	5V@9.5A, 12V@1.20A, -12V@0.5A	5V@9.5A, 12V@1.20A, -12V@0.5A	5V@9.5A, 12V@1.20A, -12V@0.5A	5V@15A, 3.3V@12A, 12V@5A, -12V@2A
AC Input Current	1.5A	1.5A	1.5A	1.5A	2 A max @ 100VAC; 1A max @ 240VAC
AC input voltage	100 to 240VAC	100 to 240VAC	100 to 240VAC	100 to 240VAC	100 to 240VAC
DC Input Voltage	-38 to -75VDC	-38 to -75VDC	-38 to -75VDC	-38 to -75VDC	-18 to -75VDC
DC Input Current	Current: 2.0 amps	Current: 2.0 amps	Current: 2.0 amps	Current: 2.0 amps	8 A @ 24VDC
DC Power Dissipation	75W (maximum)	75W (maximum)	75W (maximum)	75W (maximum)	215W (max), 745 BTU/hr
Frequency	47-63Hz	47-63Hz	47-63Hz	47-63Hz	47-63Hz
Operating temperature	-32 to 104 F (0 to 40 C)	-32 to 104 F (0 to 40 C)	-32 to 104 F (0 to 40 C)	-32 to 104 F (0 to 40 C)	-32 to 104 F (0 to 40 C)
Nonoperating temperature	-40 to 158 F (-40 to 70 C)	-40 to 158 F (-40 to 70 C)	-40 to 158 F (-40 to 70 C)	-40 to 158 F (-40 to 70 C)	-40 to 158 F (-40 to 70 C)
Relative Humidity Noncondensing	5–95%	5–95%	5–95%	5–95%	5–95%
Operation altitude (derate 1C per 1,000 ft.)	Up to 6500 ft (2000m) @ 40 C	Up to 6500 ft (2000m) @ 40 C	Up to 6500 ft (2000m) @ 40 C	Up to 6500 ft (2000m) @ 40 C	Up to 6500 ft (2000m) @ 40 C
Dimensions (HxWxD)	1.69" (4.3 cm) x 17.5" (44.5 cm) x 11.8" (30 cm)	1.69" (4.3 cm) x 17.5" (44.5 cm) x 11.8" (30 cm)	1.69" (4.3 cm) x 17.5" (44.5 cm) x 11.8" (30 cm)	1.69" (4.3 cm) x 17.5" (44.5 cm) x 11.8" (30 cm)	3.46" x 17.0" x 11.20" (8.78 x 45.36 x 28.45 cm)
Rack Height	1RU	1RU	1RU	1RU	2RU
Weight (min.)	8.85 lb (4.66 kg)	8.85 lb (4.66 kg)	8.85 lb (4.66 kg)	8.85 lb (4.66 kg)	15 lb (6.80 kg)
Noise Level (min.)	38-dbA	38-dbA	38-dbA	38-dbA	45-dbA

Cisco Service and Support

Leading-edge technology deserves leading-edge support. Service and support for the Cisco 2600 Series is available on a one-time or annual contract basis. Support options range from help desk assistance to proactive, onsite consultation.

All support contracts include:

• Major Cisco IOS software updates in protocol, security, bandwidth, and feature improvements

- Full access rights to Cisco Connection Online (COO) for technical assistance, electronic commerce, and product information
- 24-hour-a-day access to the industry's largest dedicated technical support staff

A support contract maximizes the value of your technology investment throughout its lifecycle, ensuring optimum performance and availability. Augment your internal staff's capabilities by leveraging the Cisco expertise.

Contact your local sales office for further information.

Network Module Options

The Cisco 2600 Series supports the Network Modules listed in Table 2; these modules are shared with the Cisco 3700 Series.

Table 3 Network Modules supported on the Cisco 2600 Series Serial and ATM NMs (requires IOS release 11.3 (3)T or later)

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
NM-4T1-ATM[1,2]	4-port T1 ATM with IMA NM	X	X	X
NM-4E1-ATM[1,2]	4-port E1 ATM with IMA NM	X	X	X
NM-8T1-ATM[1,2]	8-port T1 ATM with IMA NM	X	X	X
NM-8E1-ATM[1,2]	8-port E1 ATM with IMA NM	X	X	X
NM-1A-T3[1,3]	1-Port DS3 ATM NM	X	X	X
NM-1A-E3[1,3]	1-Port E3 ATM NM	X	X	X
NM-16A	16-port high density async NM	X	X	X
NM-32A	32-port high density async NM	X	X	X
NM-4A/S	4-port low speed (128 Kbps max) async/ sync serial NM	X	X	X
NM-8A/S	8-port low speed (128 Kbps max) async/ sync serial NM	X	X	X
NM-16A/S	16-port Async/Sync Network Module		X	X
NM-4T	4 port Synchronous Serial Network Module			X
LAN/LAN/WAN NMs				
NM-2W	Two-WAN interface card slot network module, (WAN I/F cards offered separately)	X	X	X
NM-16ESW-PWR[4]	16Port 10/100 Etherswitch NM with Power card	X	X	X
NM-16ESW[4,7]	16Port 10/100 Etherswitch NM	X	X	X

Table 3 Network Modules supported on the Cisco 2600 Series Serial and ATM NMs (requires IOS release 11.3 (3)T or later) (Continued)

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
NM-1E	1-port Ethernet network module	X	X	
NM-4E	4-port Ethernet network module	X	X	
NM-1ATM-25	1-port ATM 25Mbps network module	X	X	
Dial, ISDN, Analog Modems & Chan Serial NM				
NM-1CE1T1-PRI	1-port channelized E1/T1/ISDN PRI network module		X	X
NM-2CE1T1-PRI	2-port channelized E1/T1/ISDN PRI network module		X	X
NM-1CT1	1-port channelized T1/ISDN PRI network module	X	X	X
NM-1CT1-CSU	1-port channelized T1/ISDN PRI with CSU network module	X	X	X
NM-2CT1	2-port channelized T1/ISDN PRI network module	X	X	X
NM-2CT1-CSU	2-port channelized T1/ISDN PRI with CSU network module	X	X	X
NM-1CE1B	1-port channelized E1/ISDN PRI balanced network module	X	X	X
NM-1CE1U	1-port channelized E1/ISDN PRI unbalanced network module	X	X	X
NM-2CE1B	2-port channelized E1/ISDN PRI balanced network module	X	X	X
NM-2CE1U	2-port channelized E1/ISDN PRI unbalanced network module	X	X	X
NM-4B-S/T	4-port ISDN BRI network module (S/T interface)	X	X	X
NM-4B-U	4-port ISDN BRI with NT-1 network module (U interface)	X	X	X
NM-8B-S/T	8-port ISDN BRI network module (S/T interface)	X	X	X
NM-8B-U	8-port ISDN BRI with NT-1 network module (U interface)	X	X	X
NM-8AM-V2	8 analog modem network module with V.92 Support		X	X
NM-16AM-V2	16 analog modem network module with V.92 support		X	X
NM-8AM	8 analog modem network module	X	X	X

Table 3 Network Modules supported on the Cisco 2600 Series Serial and ATM NMs (requires IOS release 11.3 (3)T or later) (Continued)

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
NM-16AM	16 analog modem network module	X	X	X
Voice/Fax NMs				
NM-HDV-1T1-12[1, 2]	12-channel T1 high density voice/fax network module	X	X	X
NM-HDV-1E1-12[1,5]	12-channel E1 high density voice/fax network module	X	X	X
NM-HDV-1T1-24[1,2]	24-channel T1 high density voice/fax network module	X	X	X
NM-HDV-1T1-24E[1,2]	24-channel T1 enhanced high density voice/fax network module	X	X	X
NM-HDV-1E1-30[1,5]	30-channel E1 high density voice/fax network module	X	X	X
NM-HDV-1E1-30E[1,5]	30-channel enhanced E1 high density voice/fax network module	X	X	X
NM-HDV-2T1-48[1,2]	48-channel T1 high density voice/fax network module	X	X	X
NM-HDV-2E1-60[1,5]	60-channel E1 high density voice/fax network module	X	X	X
NM-1V[1]	1-slot voice/fax network module	X	X	X
NM-2V[1]	2-slot voice/fax network module	X	X	X
EM-HDA-8FXS[6]	8 port voice/fax expansion module FXS	X	X	X
NM-HDA-4FXS[6]	High Density analog voice/fax network module with 4 FXS	X	X	X
EM-HDA-4FXO[6]	4 port voice/fax expansion module FXO	X	X	X
NM-HDV-1J1-30[7]	1-Port 30-Channel J1 High-Density Voice Network Module	X	X	X
NM-HDV-1J1-30E[5]	1-Port 30-Enhanced Channel J1 High-Density Voice Network	X	X	X
NM-HDV-FARM-C36	Network Module 36 Port DSP Farm Bundle		X	X
NM-HDV-FARM-C54	Network Module 54 Port DSP Farm Bundle		X	X
NM-HDV-FARM-C90	Network Module 90 Port DSP Farm Bundle		X	X
NM-HD-1V	One-slot IP Communications Voice/Fax Network Module		X	X

Table 3 Network Modules supported on the Cisco 2600 Series Serial and ATM NMs (requires IOS release 11.3 (3)T or later) (Continued)

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
NM-HD-2V	Two-slot IP Communications Voice/Fax Network Module		X	X
NM-HD-2VE	Two-slot IP Communications Enhanced Voice/Fax Network Module		X	X
Application Service Modules				
NM-CIDS-K9	Cisco IDS Network Module, 20-GB IDE hard disk		X	X
NM-CE-BP-20G-K9	Content Engine Network Module, basic performance, 20-GB IDE hard disk	X	X	X
NM-CE-BP-40G-K9	Content Engine Network Module, basic performance, 40-GB IDE hard disk	X	X	X
NM-CE-BP-SCSI-K9	2-port E&M voice/fax interface card for voice/fax network module	X	X	X
NM-NAM	Network Analysis Module		X	X

1. ,The voice/fax and ATM NMs require a Cisco IOS Plus feature set.
2. Requires Cisco IOS Version 12.05XK, 12.07T, 12.1, 12.1T, 12.2, 12.2T or later.
3. Requires Cisco IOS Version 12.1.2T or later.
4. 4Requires Cisco IOS Version 12.2(2)XT, 12.2(8)T or later
5. requires Cisco IOS Version 12.2(8)T or later.
6. Requires Cisco IOS Version 12.2(2)XT, 12.2(8)T or later.
7. Inline power from a DC power source requires an external cable and circuit.

Alarm Interface Controller Network Module

The Alarm Interface Controller (AIC) is a network module that greatly expands the network monitoring and control capabilities of the Cisco 2600 and 3600 Series routers. The AIC functions as an integrated entity residing within the Cisco 2600 Router to provide network alarm monitoring and remote control of network elements. The AIC reduces service provider and enterprise operating expenses by facilitating a "single box" solution, doing away with the need for a dedicated external alarm monitoring device. This greatly simplifies network layout, monitoring, and control resulting in lower operations, administration, maintenance, and provisioning (OAM&P) costs. The AIC is supported in Cisco IOS® 12.2(8)T and beyond. The AIC network module supports 64 discrete alarm monitoring points, of which 8 of the last 64 alarm points are software- configurable to accept either analog or discrete inputs. The AIC further supports 16 control relays to facilitate the remote control of network elements.

Table 4 Alarm Interface Controller (AIC) Network Module Alarm Interface Controller (AIC) Network Module Product

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
NM-AIC-641[1]	Alarm monitoring and control NM; 64 contact points and 16 control points	X	X	X[2]

1. Requires Cisco IOS Version 12.2(8)T or later.
2. Requires Cisco IOS Version 12.3(2)T or later on Cisco 2691.

WAN Interface Card Options

The Cisco 2600 Series supports all WAN Interface Cards available for the Cisco 1600, 1700, 3600, and 3700 Series, as well as two new dual-port serial WAN interface cards to maximize interface density and slot efficiency. The new dual-serial port WAN interface cards feature Cisco's new, compact, high-density Smart Serial connector to support a wide variety of electrical interfaces when used with the appropriate transition cable.

Figure 6
Dual-Port High-Speed Serial WIC (up to 2 Mbps/Port)

Figure 7
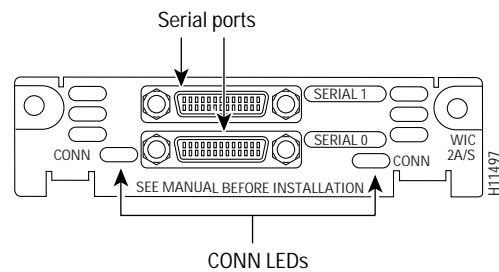Dual-Port Async/Sync Serial WIC (up to 128 Kbps/Port)

Table 5 WAN Interface Cards for the Cisco 2600 Series Cisco 2600 Series WAN WICs

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
WIC-1DSU-T1-V2	T1/Fractional T1 CSU/DSU		X	X
WIC-1DSU-T1 [1]	T1/Fractional T1 CSU/DSU	X	X	X
WIC-1DSU-56K[2]	1-port four-wire 56/64 Kbps CSU/DSU	X	X	X
WIC-1T	1-port high speed serial	X	X	X
WIC-2T	2-port high speed serial	X	X	X
WIC-2A/S	2-port async/sync serial	X	X	X
WIC-1B-S/T	1-port ISDN BRI	X	X	X

Table 5 WAN Interface Cards for the Cisco 2600 Series Cisco 2600 Series WAN WICs (Continued)

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
WIC-1B-U-V2	1-port ISDN BRI with NT1	X	X	X
WIC-1AM[3]	1-port Analog Modem interface card	X	X	X
WIC-2AM[3]	2-port Analog Modem interface card	X	X	X
WIC-1ADSL-DG	1-port ADSL WAN Interface with Dying Gasp		X	X
WIC-1ADSL[4]	1-port ADSL WAN Interface	X	X	X
WIC-1ADSL-I-DG	1-port ADSLoISDN WAN Interface		X	X
WIC-1SHDSL-V2	1-port G.SHDSL WAN Interface with two or four wire support		X	X
WIC-1SHDSL[2]	1-port G.SHDSL WAN Interface	X	X	X

1. Requires Cisco IOS 12.0(5)XK or later.
2. Requires Cisco IOS 12.2(4)XL or later.
3. Requires Cisco IOS 12.2(2)XB or later and IOS IP Plus feature set.
4. Requires Cisco IOS 12.1(5)YB, 12.2(2)XK, 12.2(4)T or later.

Table 6 Voice Interface Cards for Use with the Voice/Fax Network Modules Module Voice Interface Cards supported for use with the Voice/Fax NMs

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
VIC-2BRI-S/T-TE[1]	2-port BRI S/T terminal equipment voice/ fax interface card for voice/fax NM	X	X	X
VIC2-2BRI-NT/TE3	2-port BRI (NT and TE) Voice Interface module		X	X
VIC-2BRI-NT/TE3	2-port BRI (NT and TE) Voice Interface module	X	X	X
VIC-2FXS	2-port FXS voice/fax interface card for voice/fax NM	X	X	X
VIC2-2FXS	2-port FXS voice/fax interface card for voice/fax NM		X	X
VIC-4FXS/DID	4-port FXS voice/fax interface card. (Note: The DID feature is not supported at this time.)		X	X
VIC-2FXO-M1[2]	2-port FXO voice/fax interface card for voice/fax NM w/ Caller ID & supervisory disconnect (North American version and other countries)	X	X	X
VIC-2FXO	2-port FXO voice/fax interface card for voice/fax network module (North American version and other countries)	X	X	X

Table 6 Voice Interface Cards for Use with the Voice/Fax Network Modules Module Voice Interface Cards supported for use with the Voice/Fax NMs (Continued)

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
VIC2-2FXO	Two-port Voice Interface Card—FXO (Universal)		X	X
VIC2-4FXO	Four-port Voice Interface Card—FXO (Universal)		X	X
VIC-2FXO-M22	2-port FXO voice/fax interface card with Caller ID and supervisory disconnect (Europe version)	X	X	X
VIC-2FXO-EU	2-port FXO voice/fax interface card (Europe version)	X	X	X
VIC-2FXO-M3	2-port FXO voice/fax interface card for Australia	X	X	X
VIC-2E/M	2-port E&M voice/fax interface card for voice/fax network module	X	X	X
VIC2-2E/M	2-port E&M voice/fax interface card for voice/fax network module		X	X
VIC-2DI	2-port DID (Direct Inward Dial) voice/fax interface card	X	X	X
VIC-2CAMA	Two-port CAMA trunk interface card	X	X	X

1. Supported with Cisco IOS 12.0(3)T or later.
2. Supported with Cisco IOS 12.1(2)XH or later.

Table 7 Cisco 2600 Series Supported Multiflex Voice/WAN Interface Cards for Use with Voice/Fax Network Modules and as a Standalone WAN Interface Cisco 2600 Series Multiflex Voice/WAN WICs

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
VWIC-1MFT-T1[1]	1-port T1/Fractional T1 Multiflex Trunk with CSU/DSU	X	X	X
VWIC-2MFT-T1[1]	2-port T1/Fractional T1 Multiflex Trunk with CSU/DSU	X	X	X
VWIC-2MFT-T1-DI[1]	2-port T1/Fractional T1 Multiflex Trunk with CSU/DSU and Drop & Insert	X	X	X
VWIC-1MFT-E1[1]	1-port E1/Fractional E1 Multiflex Trunk with DSU	X	X	X
VWIC-2MFT-E1[1]	2-port E1/Fractional E1 Multiflex Trunk with DSU	X	X	X
VWIC-2MFT-E1-DI[1]	2-port E1/Fractional E1 Multiflex Trunk with DSU and Drop & Insert	X	X	X

Table 7 Cisco 2600 Series Supported Multiflex Voice/WAN Interface Cards for Use with Voice/Fax Network Modules and as a Standalone WAN Interface Cisco 2600 Series Multiflex Voice/WAN WICs (Continued)

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
VWIC-1MFT-G703[2]	1-port G.703 Multiflex Trunk	X	X	X
VWIC-2MFT-G703[2]	2-port G703 Multiflex Trunk	X	X	X

1. Requires Cisco IOS 12.0(5)XK or later.
2. Requires Cisco IOS 12.1(1)T or later.

Advanced Integration Module Options

All Cisco 2600 Series are equipped with an internal slot to support one or two field-installable AIMs. AIMs use function-specific hardware to off-load the main router CPU and accelerate processor- or resource-intensive services, yielding dramatically higher throughput and higher performance than a software-only implementation. The AIM slot has access to virtually all of the router's resources, including the main system bus. The TDM bus and the serial communications controllers make this a very flexible and powerful feature. Since the AIM is internally mounted, external slots remain available for integration of other modular components such as CSU/DSUs, WAN interfaces, or other devices such as modems, or packetized voice/fax processors.

The Data Compression AIM provides a cost-effective option for reducing recurring WAN costs and maximizes the benefit of the advanced bandwidth management features of the Cisco IOS software. With compression ratios of up to 4:1, the Data Compression AIM supports 8Mbps of compressed data throughput without imposing additional traffic latency—enough to keep two T1 or E1 circuits full of compressed data in both directions simultaneously. The Data Compression AIM supports industry standard LZS and Microsoft Point-to-Point Compression (MPPC) algorithms and ensures compatibility with all Cisco products supporting hardware- or software-based compression.

For example, the Data Encryption AIM offloads encryption processing from the Cisco 2600 Series CPU, providing 10 times the performance over software-only encryption. The new AIM-VPN/BPII and AIM-VPN/EPII supports a maximum number of 800 remote access tunnels when using the Cisco 2600 models. These modules offer hardware accelerated DES/3DES and the new AES (Advanced Encryption standard) encryption at speeds up to 80-Mbps performance (max based on 1400 byte packet size). In addition the AIM-VPN/BPII and AIM-VPN/EPII support hardware-assisted layer-3 compression services where bandwidth conservation may lower network connection costs.

The new AIM-ATM provides a high-performance hardware-based ATM access solution for one to four T1 or E1 connections supported by the T1 or E1 VWICs (for example, VWIC-IMFT-T1). This frees the network module slot to support other functions. When used in combination with a high density voice network module (NM-HDV-xxx), the ATM AIM supports ATM adaptation layer (AAL) 2 and AAL5 VoATM. In addition, the new ATM-VOICE-30 and ATM-ATM-VOICE-30 AIMs provides a cost effective solution for supporting voice services or digital voice over ATM (AAL2 and AAL5) support, without the use of a network module.

Table 8 Advanced Integration Module for the Cisco 2600 Series Cisco 2600 Series AIMs

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
AIM-COMPR2	Data Compression AIM for the Cisco 2600 Series (requires IOS software release 12.02T or later)	X	X	

Table 8 Advanced Integration Module for the Cisco 2600 Series Cisco 2600 Series AIMs

Product Number	Description	Cisco 2612	Cisco 2600XM	Cisco 2691
AIM-COMPR4	Data Compression AIM for the Cisco2691, 3660 and 3700 Series			X
AIM-VPN/BP	DES/3DES Data VPN Encryption AIM for the Cisco 2600 series	X	X	
AIM-VPN/BPII	DES/3DES/AES VPN Encryption & Compression Module for 2600XM		X	
AIM-VPN/EP[1]	DES/3DES Data VPN Encryption AIM for the Cisco 2600 series	X	X	X
AIM-VPN/EPII	DES/3DES/AES VPN Encryption & Compression Module for 2691/3725			X
AIM-ATM	High Performance ATM Advanced Integration Module	X	X	X
AIM-VOICE-30	30 Channel T1/E1 Digital Voice Module (requires IOS software release IOS 12.2(2)XB or later)	X	X	X
AIM-ATM-VOICE-30	ATM SAR and 30 Channel T1/E1 Digital Voice Module (requires IOS software release IOS 12.2(2)XB or later)	X	X	X

1. Recommended with the Cisco 265x and 265xXM.

CISCO SYSTEMS

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
       800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
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Cisco Systems, Inc.
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