

WS-X4604-GWY: Access Gateway Module (AGM) for Catalyst 4000 Series Switches

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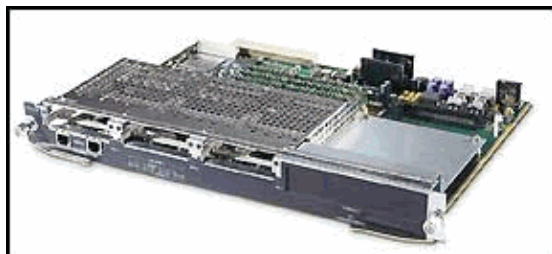
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Introduction

The Cisco Catalyst 4500 Access Gateway Module (AGM) enables organizations to implement integrated IP Telephony and WAN services at campus and integrated branch office sites. The combination of the WAN and voice infrastructure into Cisco Catalyst 4500 Series switches gives organizations the ability to reduce network complexity, enhance employee productivity, and improve network deployment times through an integrated platform while preparing for data, voice, and video convergence across the enterprise.

The Cisco Catalyst 4000 AGM can be deployed in both Cisco Catalyst 4500 Series and Catalyst 4000 Series chassis which run either Catalyst OS (CatOS) or Cisco IOS® Software and is fully compatible with all Supervisor Engines. You can deploy multiple AGMs in the chassis to support higher density requirements or provide a higher level of availability and resiliency.



The Cisco Catalyst 4000 Access Gateway Module has three modes of functionality:

- Voice network services
- Voice gateway
- IP routing

The Cisco Catalyst 4000 AGM is supported in the Catalyst 4500 and 4000 Series chassis with any Supervisor Engine that runs CatOS 5.5(1) or Cisco IOS Software Release 12.1(13)EW or later. The AGM itself runs a separate instance of Cisco IOS Software that must be release 12.1(5)YF or later to support CatOS Supervisor Engines or release 12.2(13)T or later to support Cisco IOS Supervisor Engines.

For more information, refer to Cisco Catalyst 4500 Series Access Gateway Module Data Sheet.

Prerequisites

Requirements

There are no specific prerequisites for this document.

Components Used

These tables show in detail the voice and data interfaces that are supported along with the minimum release of Cisco IOS Software required. The Catalyst 4000 AGM is supported in the Catalyst 4003 and 4006 and requires Cat OS 5.5(1) or later.

Data Interfaces

Interface	Encapsulations	Minimum IOS	Comments
WIC-2A/S (128K)	HDLC, PPP, FR	12.1(5)T	No asynchronous support (WIC-2T future)
WIC-2T	HDLC, PPP, FR	12.2(13)T	WIC-1T is not supported
WIC-1DSU-56K4	HDLC, PPP, FR	12.1(5)T	
VWIC-xMFT-T1	HDLC, PPP, FR	12.1(5)T	Channel group, no PRI ISDN
VWIC-2MFT-T1-DI	HDLC, PPP, FR	12.1(5)T	Channel group, no PRI ISDN
VWIC-xMFT-E1	HDLC, PPP, FR	12.1(5)T	Channel group, no PRI ISDN

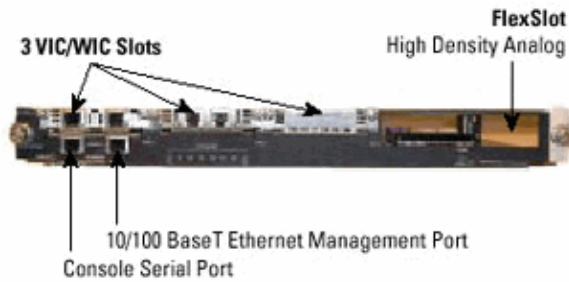
VWIC-2MFT-E1-DI	HDLC, PPP, FR	12.1(5)T	Channel group, no PRI ISDN
VIC-2BRI-S/T-TE	HDLC, PPP, FR	12.1(5)T	User side S/T only, no 144k/80k leased line

Voice Interfaces

Interface	Encapsulations	Minimum IOS	Comments
VIC-2FXS	GS, LS	12.1(5)T	Hook-flash, CLID supported
VIC-2FXO	GS, LS	12.1(5)T	CLID supported
VIC-2FXO-EU	GS, LS	12.1(5)T	CLID supported
VWIC-xMFT-T1	T1 CAS, PRI	12.1(5)T	PRI network and user side, T1 CAS
VWIC-2MFT-T1-DI	T1 CAS, PRI	12.1(5)T	PRI network and user side, T1, CAS, no D&I
VWIC-xMFT-E1	PRI	12.1(5)T	PRI network and user side, T1, CAS, no D&I
VWIC-2MFT-E1-DI	PRI	12.1(5)T	PRI network and user side, no D&I
WS-U4604-8FXS	LS	12.1(5)YF	CLID supported
WS-U4604-16FXS	LS	12.2(15)T	CLID supported

Hardware and Interface Overview

The physical interfaces and modularity for the Catalyst 4000 AGM are shown in this example.



In addition to the modules and interfaces detailed in the tables in this document, the Catalyst 4000 AGM also incorporates:

- MPC 8260 processor with Cisco IOS software
- One Gigabit Ethernet backplane interface which supports 802.1q with multiple VLANs
- One Fast Ethernet front panel interface for management
- Onboard support for 4x6 DSP SIMMs
- Onboard interface for a WAN encryption module (future)
- FlexSlot to support high-density analog modules (future)

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Ordering Information

Product Number	Description
WS-X4604-GWY	Catalyst 4000 AGM with IP/FW IOS
WS-X4604-VOICE	Catalyst 4000 Access Gateway Module Voice/WAN bundle (AGM, 96-channel DSP set, 128 MB DRAM)
WS-U4604-DSP	Catalyst 4000 DSP SIMM Bank (4x 6 SIMMs)
S4AGMCMV-12215T	Catalyst 4000 AGM Cisco IOS IP/VOICE (Default)
S4AGMRHK9-12215T	Catalyst 4000 AGM Cisco IOS IP/VOICE/IPX/SNA/FW/IDS/WAN 3DES
WS-U4604-ESA(=)	Cisco Catalyst 4000 AGM VPN/Encryption Service Adapter
WS-U4604-16FXS	Cisco Catalyst 4000 AGM 16-port RJ-21 FXS module
WS-U4604-8FXS	Cisco Catalyst 4000 AGM 8-port RJ-21 FXS module

Features and Benefits

The primary features of the Cisco Catalyst 4000 AGM include Telephony and WAN routing.

Telephony Features

- **Survivable Remote Site Telephony (SRST)** The Cisco CallManager can be used for centralized control of the Cisco Catalyst 4000 AGM at campus and branch sites. The AGM supports both Media Gateway Control Protocol (MGCP) and H.323v2 interfaces to the Cisco CallManager. SRST enables a resilient IP Telephony service when connectivity to the Cisco CallManager is lost. The AGM provides SRST for up to 240 IP phones.
- **Audio–conferencing** The digital signal processor (DSP) farm on the Cisco Catalyst 4000 AGM can be used to support on–demand and dedicated reservationless audio–conference services for local and remote users. Audio transcoding between G.729 and G.711 enables efficient communications between callers who use different codecs (for example, campus phones that use G.711 and remote site phones that use G.729).
- **Fax/modem/PBX voice gateway** Foreign exchange station (FXS) ports on the Cisco Catalyst 4000 AGM can support up to 22 fax machines, speakerphones, modems, analog phones, and PBX lines to supplement IP phones at a campus or branch.
- **Public Switched Telephone Network (PSTN) voice gateway** The Cisco Catalyst 4000 AGM incorporates a 96–channel DSP farm with up to six digital (T1, E1, Primary Rate Interface [PRI], Basic Rate Interface [BRI]) or analog Foreign Exchange Office (FXO) interfaces with compression and echo cancellation services for connectivity to the PSTN or toll bypass with ISDN dial backup. Signaling support includes T1 channel–associated signaling (CAS), BRI signaling, ISDN PRI, Q.SIG, and R2 signaling.

WAN Routing Features

- **Cisco IOS Multiprotocol routing** The Cisco Catalyst 4000 AGM supports multiprotocol routing with support for IP, IPv6, Internetwork Packet Exchange (IPX), AppleTalk and System Network Architecture (SNA) as well as Web Cache Control Protocol version 2 (WCCPv2).
- **WAN interfaces** Up to six WAN interfaces are supported per module, which includes T1, E1, PRI, BRI, and serial ports.
- **WAN security** Security options include firewall, intrusion detection system (IDS), Network Address Translation (NAT) and hardware–based IP security (IPsec) with 3DES data encryption for secure VPN or public Internet connectivity. The Encryption Service Adapter (ESA) is a high–performance data encryption module that implements data encryption and authentication algorithms. For more detail about ESA, refer to Catalyst 4000 Service Encryption Adapter Installation and Configuration Note.
- **Quality of service (QoS)** Features such as the Resource Reservation Protocol (RSVP), Protocol Independent Multicast (PIM), traffic shaping, custom and priority queuing, Low Latency Queuing (LLQ), and Weighted Fair Queuing (WFQ) ensure a consistent QoS for data, voice, and video applications over the WAN.

Voice Gateway Features

- Cisco IOS IP routing, H.323v2, and MGCP VoIP gateway functions.
- A DSP farm that supports up to 96 digital voice channels with G.711 or G.729a voice or analog voice, conferencing, and transcoding.
- Fax relay, G.711 fax pass–through and modem pass–through services compatible with other Cisco

IOS gateways.

- Time-division multiplexing (TDM), that switches between analog and digital ports, enables faster connection speeds for modems and fax machines.

Advanced Voice Services

- **Conferencing** Each DSP bridges up to six participants in a single on-demand or dedicated, reservationless conference call.
- **Transcoding** Each DSP bridges up to two full-duplex channels from G.711 to G.729a.
- **Voice gateway** Each DSP supports up to four digital voice channels or analog ports, or two channels per DSP for Voice Interface Card (VIC) modules.

Network Management

- Simple Network Management Protocol (SNMP) compliant
- CiscoWorks interface for configuration
- Cisco Voice Manager
- Cisco CallManager

Specifications: IP Routing Performance

- **Processor Type** MPC8260
- **Flash Memory** 2MB
- **System Memory** 4MB (default), 128 MB (maximum)
- **Performance** Up to 45kpps

Connectors, Interfaces, and Indicators

- One 1000BaseT backplane interface
- One 10/100BaseT RJ45 management interface
- Two VIC/VWIC/WIC slots
- One VIC/VWIC slot (this does not support WIC)
- One ESA(Encryption Service Adapter) slot
- One FlexSlot for high-density analog modules
- One Console/auxiliary port, RJ45 serial
- One Module status indicator
- Four DSP presence indicators
- Four DSP activity indicators

Physical Specifications

- Occupies one slot in a Catalyst 4000 family platform
- Dimensions (H x W x D): 1.75 x 17.5 x 11.8 in (4.4 x 44.5 x 30 cm)

Environmental Conditions

- **Operating temperature** 2 to 104°F (0 to 40°C).
- **Storage temperature** -4 to 149°F (-20 to 65°C).
- **Operating Relative humidity** 0 to 85 percent, noncondensing.

- **Operating altitude** Up to 6500 ft. (2000m).

Safety

- UL1950, CSA C22.2 No. 950, EN60950, IEC60950, TS001, AS/NZS 3260

EMC

- CE marking
- FCC Part 15 (CFR47) Class A
- EN55022 Class A with Unshielded Twisted Pair (UTP), Class B with Foil Twisted Pair (FTP)
- CISPR22 Class A with UTP, Class B with FTP
- VCCI Class A with UTP, Class B with FTP
- AZ/NZS 3548 Class A with UTP, Class B with FTP
- EN55024
- EN 300 386–1
- EN 300 386–2

Network Management Support

- SNMP compliant
- CiscoWorks interface for configuration
- Cisco Voice Manager
- Cisco CallManager
- Switched Port Analyzer (SPAN) or port mirroring support
- Dial Control MIB (RFC 2128) and CISCO dial control mib. ext. to RFC 2128
- CISCO-VOICE-DIAL-CONTROL-MIB Voice Dial Control MIB
- CISCO-VOICE_IF_MIB. Voice Interface MIB
- CISCO-VOICE-ANALOG-IF_MIB Voice Analog Interface MIB
- CISCO-DSP-MGMT-MIB Digital Signal Processing Management MIB
- RFC 1157 SNMP
- RFC 1643 Ethernet MIB
- RFC 1213 MIB II
- RFC 1573 MIB II Interface extensions

Configuration

- Access Gateway Module Installation and Configuration Note
 - Catalyst 4000 Family Access Gateway Module DSP Upgrade Installation Note Contents
 - Configuring the Catalyst 6000 WS-X6624 FXS Blade with Cisco CallManager 3.x
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Related Information

- **Cisco Catalyst 4500 Series Access Gateway Module Data Sheet**
- **Release Notes for Cisco Catalyst 4000 Access Gateway Module for Cisco IOS Release 12.2T**
- **Catalyst 4000 Service Encryption Adapter Installation and Configuration Note**
- **EOS & EOL for the Cisco Catalyst 4500 Access Gateway Module**
- **Access Gateway Module DSP Upgrade Installation Note**
- **Voice Technology Support**

- **Voice and IP Communications Product Support**
 - **Recommended Reading: Troubleshooting Cisco IP Telephony**
 - **Technical Support & Documentation – Cisco Systems**
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