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Cisco 3800 and 3900 Series ATM OC-3 Network Module

Cisco Systems® extends WAN connectivity by adding high-speed ATM access to remote branch offices with the Cisco® 3800 and 3900 ATM OC-3 Network Module.

Overview

A 155-Mbps ATM OC-3 network module is available on the Cisco 3825 and 3845 integrated services routers and on Cisco 3925 and 3945 Integrated Services Routers, starting with Cisco IOS® Software Release 12.4(3) Mainline and 15.0(1)M respectively(Figure 1). The network module supports the ATM forum standard ATM Adaptation Layer 5 (AAL5) with the following ATM quality of service (QoS) traffic classes: unspecified bit rate (UBR), UBR+, real-time variable bit rate (VBR-rt), non-real-time VBR (VBR-nrt), available bit rate (ABR), and constant bit rate (CBR). Voice over IP (VoIP) and H.323 over ATM is supported over the WAN using the currently available onboard voice digital signal processors (DSPs), analog voice and fax network modules, and voice interface cards.

The network module has modular optics supporting the Cisco pluggable optical modules (POMs) and Cisco Small Form-Factor Pluggables (SFPs), simplifying the selection of network modules from six offerings to one. The SFPs support STM-1 framing standards over multimode, single-mode intermediate-reach, and single-mode long-reach fiber-optic interfaces. The module is a single-port module with LC-type connector. The single-mode SFPs combined with the ATM network module provide high-speed trunking for users with access to a fiber WAN, whereas multimode is ideal for connecting high-speed servers, switches, or hubs equipped with OC-3/STM-1 fiber connections.

Cisco IOS SP Services feature sets are required to support ATM. A maximum of one ATM OC-3 network module is recommended on the Cisco 3825 and Cisco 3925, and a maximum of two ATM OC-3 network modules are recommended on the Cisco 3845 and Cisco 3945

Figure 1. Cisco 3800 and 3900 Series ATM OC-3 Network Module



Product Summary

The Network module supports three different SFPs, each with a different physical interface, support OC-3c/STM-1 multimode, OC-3c/STM-1 single-mode intermediate-reach, and OC-3c/STM-1 single-mode long-reach modes, however the module supports ATM OC-3 only. Table 1 lists the SFPs supported on the new network module.

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Table 1. ATM OC-3 Network Module and Supported POMs and SFPs

Product Number	Product Description
NM-1A-OC3-POM	ATM OC3 module with single POM (SFP) slot
SM-NM-ADPTR	Network Module Adapter for SM Slot on Cisco 2900 and 3900 Series ISR
SFP-OC3-MM	OC3/STM1 SFP, Multi-mode fiber
SFP-OC3-IR1	OC3/STM1 SFP, Single-mode fiber, Intermediate Reach
SFP-OC3-LR1	OC3/STM1 SFP, Single-mode fiber, Long Reach (40km)

For more information on SFP's, go to:
http://www.cisco.com/en/US/prod/collateral/modules/ps5455/ps6579/product_data_sheet0900aecd80285547.html

New Features

New features of the new network modules follow:

- RFC 1577 support for routing over ATM
- RFC 1483 support for multiple encapsulations over ATM
- ATM Forum User-Network Interface (UNI) 3.0, 3.1, and 4.0
- ATM permanent virtual circuits (PVCs) and switched virtual circuits (SVCs)
- LAN Emulation (LANE) 2.0
- Layer 2 per-VC queuing
- Up to 1024 simultaneous virtual circuits
- AAL5 ATM adaptation layer
- ATM service classes: UBR, UBR+, VBR-rt, VBR-nrt, ABR, and CBR (data only)
- Permanent virtual paths (PVPs)
- ATM bandwidth (resource) manager
- Multiprotocol over ATM (MPOA) client and server
- Multiprotocol Label Switching (MPLS)
- IETF Point-to-Point Protocol (PPP) over ATM
- Next Hop Resolution Protocol (NHRP)
- F4 and F5 operations and management (operation, administration, and maintenance [OAM]) cell support
- Interim Local Management Interface (ILMI)

System Requirements

- The new network module is supported on the Cisco 3825, Cisco 3845, Cisco 3925 and Cisco 3945
- SP Services feature sets of Cisco IOS Software Release 12.4(3) Mainline or above and 12.4(4)T or above are required.
- A maximum of one ATM OC-3 network module is supported on the Cisco 3825 and Cisco 3925 ; the maximum for the Cisco 3845 and Cisco 3945 is two.
- The system requires no additional flash or DRAM memory other than the Cisco IOS Software Release 12.4(3) Mainline and 12.4(4)T feature set specified minimum memory requirements.
- No slot dependent.

Table 2 gives support and orderability information for Cisco IOS Software.

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Table 2. Cisco IOS Software Support and Orderability Rules

Product	Cisco IOS Software Version Required	Cisco IOS Feature Sets Required	Minimum DRAM Memory	Maximum Supported
Cisco 2600 Series, Including Cisco 2610, 2611, 2620, 2621, 2650, 2651, and 2691 Multiservice Platforms and Cisco 2610XM, 2611XM, 2620XM, 2621XM, 2650XM, and 2651XM Multiservice Routers	Not supported	-	-	-
Cisco 2800 and 2900 Series, Including Cisco 2801, 2811, 2821, 2851, 2901, 2911, 2921 and 2951	Not supported	-	-	-
Cisco 3600 Series, Including Cisco 3620, 3640, and 3660 Multiservice Platforms	Not supported	-	-	-
Cisco 3700 Series, Including Cisco 3725 and 3745 Multiservice Access Routers	Not supported	-	-	-
Cisco 3825 Integrated Services Router	12.4(3) Mainline and 12.4(4)T	SP Services*	Same as 12.4(3) Mainline and 12.4(4)T Cisco IOS SP Services feature sets DRAM minimum memory requirements.	1
Cisco 3845 Integrated Services Router	12.4(3) Mainline and 12.4(4)T	SP Services*	Same as 12.4(3) Mainline and 12.4(4)T Cisco IOS SP Services feature sets DRAM minimum memory requirements.	2
Cisco 3925 Integrated Services Router **	15.0(1)M	Data License	Same as 15.0(1)M	1
Cisco 3945 Integrated Services Router **	15.0(1)M	Data License	Same as 15.0(1)M	2

* OC-3 ATM network modules are not supported in IP Base, IP Voice, Enterprise Base, and Advanced Security Feature Sets. ATM is supported in Advanced Services, Enterprise Services, and Advanced Enterprise Services feature sets.
** Support for the OC-3 ATM network modules in the 3925, and 3945 will be via the network module adapter card.

Table 3 gives ATM service category definitions, and Table 4 lists their attributes and guarantees.

Table 3. ATM Service Category Definitions

ATM Service Categories	Typical Use
UBR	Best-effort service intended for non-real-time bursty applications that do not require a guarantee of traffic characteristics such as bandwidth, cell delay, and cell delay variation.
UBR+	Provides a guaranteed frame rate (GFR) service with single leaky bucket algorithm; provides the ability to reserve UBR bandwidth minimum, or specify bandwidth maximum; similar to VBR in that it increases the minimum cell rate (MCR) when cell rate falls below the MCR.
VBR-rt and VBR-nrt	Intended for applications that have bursty traffic patterns but require a guarantee of some traffic parameters; a peak cell rate (PCR), sustained cell rate (SCR), and maximum burst size (MBS) can specify traffic parameters.
ABR	Employed to maximize bandwidth use of the ATM link by using congestion feedback notification (resource management cells); both PCR and MCR specify the ABR connection; the transmit rate of each connection is flow-controlled such that the rate is always between the user-specified values for a minimum and peak rate.
CBR	Intended for real-time applications such as Systems Network Architecture (SNA) traffic, voice, and video, which require a fixed bandwidth and low cell delay; CBR in initial release supports data only.

Table 4. ATM Service Category Attributes and Guarantees

Service Category	Traffic Description	Minimum Loss Cell Loss Ratio (CLR)	Delay Variance	Bandwidth	Use of Feedback Control
UBR	PCR	No	No	No	No
UBR+	PCR	Yes	No	No	No
VBR-rt	PCR, SCR, and MBS	Yes	Yes	Yes	No
VBR-nrt	PCR, SCR, and MBS	Yes	No	Yes	No
ABR	PCR, MCR+, and behavior parameters	Yes	No	Yes	Yes

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Service Category	Traffic Description	Minimum Loss Cell Loss Ratio (CLR)	Delay Variance	Bandwidth	Use of Feedback Control
CBR	PCR	Yes	Yes	Yes	No

Table 5 lists the ATM OC-3 LED's with their functions and color.

Table 5. ATM OC-3 Network Modules LED Description

ATM OC-3 LEDs	Function	Color
ENABLED	This LED indicates the ATM OC-3 network module has passed self-tests and is available to the router.	Green
RX CR	This LED indicates that a carrier signal is present.	Green
RX CL	This LED indicates that a cell was received.	Green
TX CL	This LED indicates that a cell was transmitted.	Green
RX ALM	This LED is an alarm indication signal.	Yellow

OC-3 ATM Physical Specifications

Table 6 gives specifications for the Cisco 3800 and 3900 Series ATM OC-3 Network Module.

Table 6. Product Specifications

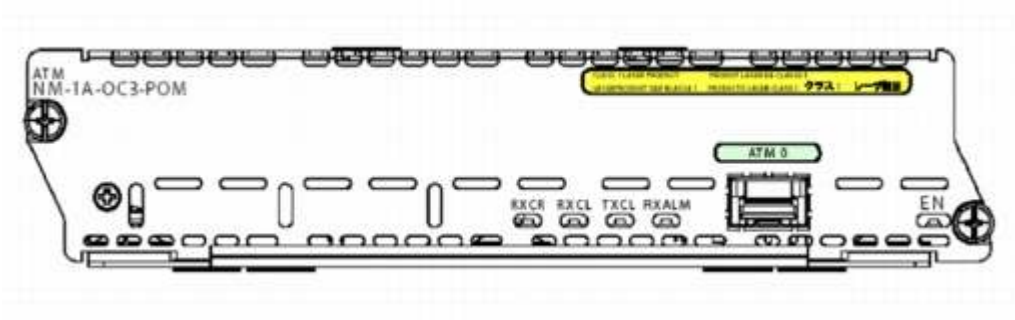
Feature	Description
Dimensions (H x W x D)	1.6 x 7.10 x 7.2 in. (4.1 x 18.0 x 18.2 cm)
Weight	2 lb maximum (1 kg maximum)
Environmental Conditions	Operating temperature: 32 to 104℉ (0 to 40℃) Nonoperating temperature: -13 to 158℉ (-25 to 70℃)
Relative Humidity	5 to 95%
Protocols Supported	All in Cisco IOS Software Release 12.4(3)
Cabling	LC-type connector
Network Interfaces	Compatible with all existing network modules and WICS supported by Cisco 2600/2691/3600/3700/3800/3900 routers
Regulatory Approvals	
Product Safety	• UL 60950 (United States) • CSA C22.2, No. 60950 (Canada) • EN 60950 (European Union) • AS/NZS 60950 (Australia and New Zealand) • IEC 60950 (International)
Immunity	• EN300386 • EN55024/CISPR24 • EN50082-1
Emissions	• ICES-003 Class A • EN55022 Class A • CISPR22 Class A • AS/NZS 3548 Class A • VCCI Class A • EN 300386 • EN61000-3-3 • EN61000-3-2
Network Management	The following MIBs are supported: • ATM-MIB • CISCO-AAL5-MIB • CISCO-ATM-PVCTRAP-EXTN-MIB • CISCO-BUS-MIB • CISCO-IETF-ATM2-PVCTRAP-MIB • CISCO-IETF-ATM2-PVCTRAP-EXTN-MIB • CISCO-LECS-MIB

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Feature	Description
	• CISCO-LES-MIB • LAN -EMULATION-CLIENT-MIB • SONET-MIB • IF-MIB • ENTITY-MIB

Figure 2. 155-Mbps ATM OC-3 Multimode Network Module



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