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Cisco Catalyst 8000 Gigabit Ethernet WAN Modules

Contents

Product overview

The Cisco® Catalyst® 8000 Gigabit Ethernet WAN Modules bring high-density Small Form-Factor Pluggable (SFP+ and SFP) and copper (RJ-45) connectivity, supporting 100 Mbps, 1 Gbps, and 10 Gbps Ethernet, to the Catalyst 8300 and 8200 Series Edge Platforms.

These modules replace the Network Interface Module (NIM) and Single-Wide Enhanced Service Module (SM-X) Ethernet WAN modules supported on the Cisco 4000 Series Integrated Services Routers. Providing maximum flexibility, the modules accelerate applications such as Ethernet WAN access, Cisco SD-WAN, and other high-speed connectivity options to the LAN, top-of-rack data center switches, and servers. Support for SD-WAN and vManage is available from day 1 on all these modules.

The ports on these modules work as routed Layer 3 ports. All the features supported on the router's embedded WAN ports are also available with these WAN modules.

Layer 2 switching between local ports on the module, or between ports on the module and other ports within the router system, is not supported. The ports on these modules terminate Layer 2 trunks from externally connected switches. As such, Layer 2 trunk and VLAN information is not carried over onto other ports in the system. The host router routes all traffic entering these modules.

Power over Ethernet (PoE IEEE 802.3 af/at/bt) is supported on the C-NIM-1M module.

This data sheet also covers the SM-NIM Carrier Adapter for the Catalyst 8300 Series. This carrier card enables all combinations of voice, WAN, and LAN modules to be hot-swappable and functioning in a Service Module (SM) slot. Up to 2 NIMs are supported per carrier card without any performance or functionality limitations.

Cisco offer three types of Ethernet WAN modules:

- Cisco 1-port 10-Gbps/1-Gbps WAN with 256-bit WAN MACsec (C-NIM-1X) **Figure 1**
- Cisco 2-port 100-Mbps/1-Gbps WAN NIM with 256-bit WAN MACsec (C-NIM-2T) **Figure 2**
- Cisco 1-port 2.5-Gbps/1-Gbps WAN NIM with Cisco UPOE® (C-NIM-1M) **Figure 3**

Cisco offers one SM-NIM Carrier Adapter card:

- Cisco single-wide service module for 2x NIMs (C-SM-NIM-ADPT) **Figure 4**

Figure 1.
Cisco 1-port 10-Gbps/1-Gbps WAN with 256-bit WAN MACsec (C-NIM-1X)

The C-NIM-1X is a next-generation 10G Layer 3 WAN module. This module provides high-speed WAN connectivity through a single SFP+ port supporting 1-Gbps and 10-Gbps WAN connections. The 10-Gbps WAN connection is a non-oversubscribed connection, since it's connecting to the backplane using a 10-Gbps link. Full 256-bit WAN MACsec is supported.

The C-NIM-1X does not support SFP transceivers for RJ-45 copper media, nor does it support 100BASE/10BASE SFP modules. The module is supported on all Catalyst 8300 Series platforms. It is not supported on the Catalyst 8200 Series platforms.
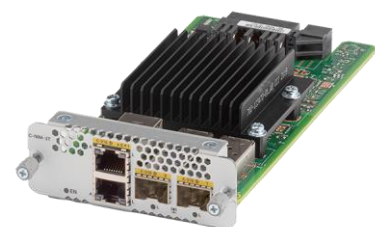
Figure 2.
Cisco 2-port 100-Mbps/1-Gbps WAN NIM with 256-bit WAN MACsec (C-NIM-2T)

The C-NIM-2T is a dual combo port module with two RJ-45 copper line ports and two SFP fiber ports. The ports on this NIM are configured in two port groups with one RJ45 port and one SFP port in each group. One port from each group can be configured for simultaneous use, providing flexibility in the selection of media for WAN connectivity. The RJ-45 ports support 100BASE-TX and 1000BASE-T copper connections. The SFP ports support 100BASE-FX and 1000BASE-X fiber connections. The module supports 256-bit WAN MACsec. The C-NIM-2T is supported on the Catalyst 8200 Series, 8200L, and all 8300 Series platforms.

Figure 3.
Cisco 1-port 2.5-Gbps/1-Gbps WAN NIM with UPOE (C-NIM-1M)

The C-NIM-1M is a single-port 2.5-Gbps BASE-T port module with Cisco UPOE+ (90W).

Its single copper port supports 100/1000/2500BASE-T connections, popularly called a Multigigabit (mGig) port. This module also supports Cisco UPOE+ (802.3bt, up to 90W), which can be used for powering a cellular gateway directly from the host router. The C-NIM-1M is supported on the Catalyst 8200 Series, 8200L, and all 8300 Series platforms.

Figure 4.
Cisco single-wide service module carrier card for 2x NIMs (C-SM-NIM-ADPT)

The C-SM-NIM-ADPT is a dual-NIM carrier card in an SM-X form factor for Catalyst 8300 Series platforms. This module supports a wide variety of NIMs, including the C-NIM Layer 3 WAN modules for the Catalyst 8000 platforms. See Table 6 for a list of supported modules. Since it connects to the backplane with two 10-Gbps links, this carrier card will not impose any bottleneck on traffic, even if two 10-Gbps C-NIM-1X modules are installed. It supports full online insertion and removal. There is no upper limit on the number of C-SM-NIM-ADPT cards that can be installed in a Catalyst 8300 Series platform, other than available SM-X slots.

Features

The Cisco Catalyst 8000 Gigabit Ethernet WAN Modules are based on the technology of the onboard Gigabit Ethernet and SFP/SFP+ ports of the Cisco Catalyst 8000 Edge Platforms. Feature support will therefore be identical to that of the onboard ports on the Catalyst 8300 and 8200 Series and the 8200L.

Module feature comparison

Table 1 compares the software and hardware features at a high level.

Table 1.   Feature comparison

Variable	Cisco 1-port 10-Gbps/1-Gbps WAN C-NIM-1X	Cisco 2-port 100-Mbps/1-Gbps WAN NIM C-NIM-2T	Cisco 1-port 2.5-Gbps/1-Gbps WAN C-NIM-1M	Cisco single-wide service module carrier card for 2x NIMs C-SM-NIM-ADPT
Form factor	NIM	NIM	NIM	SM-X
Catalyst 8000 Edge Platforms supported	8300 Series	8300 and 8200 Series, 8200L	8300 and 8200 Series, 8200L	8300 Series
Required Cisco IOS® version	17.3.2	17.6.1	17.6.1	17.3.2
WAN connection	1000BASE-X SFP 10-Gbps SFP+	100/1000 BASE-T 1000BASE-X SFP	100/1000/2500M BASE-T	–
Connection media	1x SFP/SFP+	2x RJ-45/SFP groups One port from each group can be used simultaneously	1x RJ-45	–

Variable	Cisco 1-port 10-Gbps/1-Gbps WAN C-NIM-1X	Cisco 2-port 100-Mbps/1-Gbps WAN NIM C-NIM-2T	Cisco 1-port 2.5-Gbps/1-Gbps WAN C-NIM-1M	Cisco single-wide service module carrier card for 2x NIMs C-SM-NIM-ADPT
Power over Ethernet	No	No	90W IEEE 802.3 af/at/bt	–
MACsec support (IEEE 802.1AE)	256-bit	256-bit	No	–
Online insertion and removal	Online insertion only	Online insertion only	Online insertion only	Yes
10G backplane connection to forwarding engine	Yes	No	No	Yes

Catalyst 8300 Series NIM density with C-SM-NIM-ADPT

The Gigabit Ethernet WAN modules are generally supported on all Cisco Catalyst 8000 Edge Platforms subject to the availability of an appropriate slot. You may deploy as many modules as the platform slot density allows.

Table 2 shows the maximum NIM density possible per Catalyst 8300 Series platform by using the C-SM-NIM-ADPT adapter.

Table 2.   NIM density

Platform	NIM and SM slots	Maximum supported NIMs with C-SM-NIM-ADPT
C8300-2N2S-4T2X	2 NIM, 2 SM	6x NIMs
C8300-2N2S-6T	2 NIM, 2 SM	6x NIMs
C8300-1N1S-4T2X	1 NIM, 1 SM	3x NIMs
C8300-1N1S-6T	1 NIM, 1 SM	3x NIMs

C-NIM-1M PoE

The C-NIM-1M supports one Cisco UPOE+ port (802.3bt, 90W port). The support, enablement, and exact current draw of the PoE is provided with a software API that allows the host to manage the total system draw on its PoE power supply.

Table 3.   PoE power supply specifications

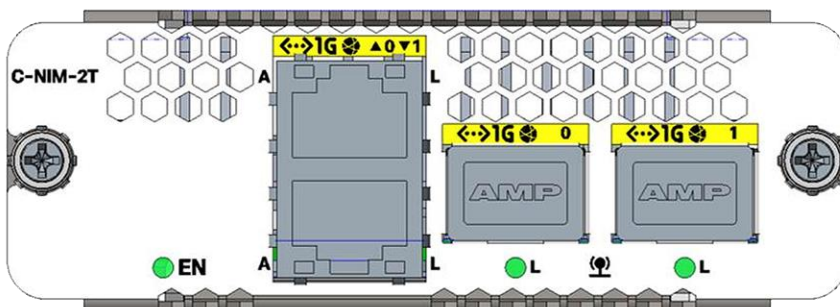|	C-NIM-1M
PoE	90W x 1
PoE voltages	Nominal: –54V Range: –53V to –55.8V

Module LED indicators

The Gigabit Ethernet WAN modules have several EN (Enabled) or L (Link) LEDs located around the SFP, SFP+, and RJ-45 ports. The LEDs indicate that the module has passed its self-test and is available to the router.
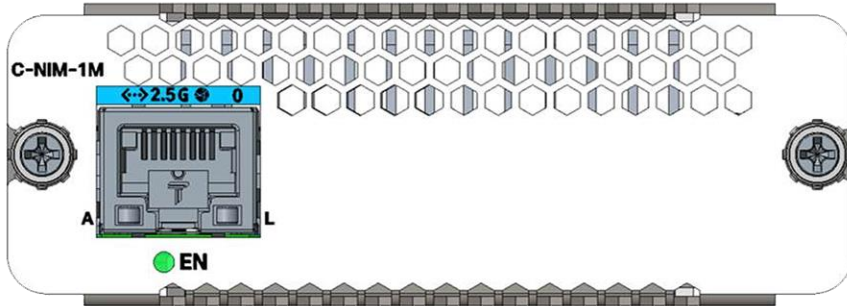
Figures 5 through 7 show the front panel LED layout. Table 4 lists the LED colors and their meanings.
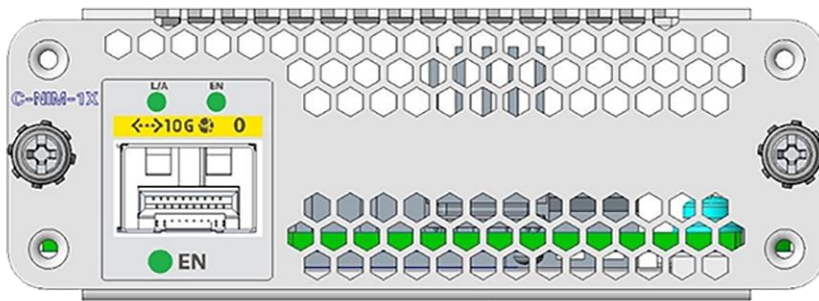
Figure 5.
C-NIM-1X front panel and LEDs

Figure 6.
C-NIM-2T front panel and LEDs

Figure 7.
C-NIM-1M front panel and LEDs

LED status

Table 4 shows the various LED status indicators on the C-NIM-1X, C-NIM-2T, and C-NIM-1M.

Table 4.   LED status indicators

LED	Color	Description
EN (All C-NIM)	Green/amber	**System status** Off: No power. Green steady on: The module is powered on and is functioning correctly. Green blink: Boot-up phase or in ROM monitor mode. Amber steady on: The module has some failure.
BASE-T ports with PoE (C-NIM-1M)	Green/amber Green	**LED L:** Link LED Off: No link. Green steady on: Link up. Amber steady on: PoE power denied due to fault (power denied or short detected). **LED A:** Off: No data. Green blinking: Transmit/receive data.
BASE-T ports without PoE (C-NIM-2T)	Green Green	**LED L:** Link LED Off: No link. Green steady on: Link up. **LED A:** OFF: No data. Green blinking: Transmit/receive data.

LED	Color	Description
SFP ports (C-NIM-2T)	Green/amber	**LED L:** Off: Not present. Green steady on: Link up. Amber steady on: SFP is not supported or is in a fault state.
SFP+ port (C-NIM-1X)	Green/amber	**SFP+ status** Off: No SFP detected or inserted. Green steady on: SFP is powered up and enabled, no activity. Green blink: SFP is powered up and enabled, active. Amber steady on: The module has some failure.

Supported SFP transceivers

Table 5 shows the supported SFP transceivers on the C-NIM-1X and C-NIM-2T.

Table 5.   Supported SFP transceivers

Module type	C-NIM-1X	C-NIM-2T
SFP-10G-BXD-I	Y	N
SFP-10G-BXU-I	Y	N
SFP-10G-BX40D-I	Y	N
SFP-10G-BX40U-I	Y	N
SFP-H10GB-ACU-7M	Y	N
SFP-H10GB-ACU-10M	Y	N
SFP-10G-SR	Y	N
SFP-10G-LR	Y	N
SFP-10G-ER	Y	N
SFP-10G-LRM	Y	N
SFP-GE-S	Y	Y
SFP-GE-L	Y	Y
SFP-GE-Z	Y	N
GLC-LH-SMD	Y	Y
GLC-ZX-SMD	Y	Y
GLC-SX-MMD	Y	Y

Module type	C-NIM-1X	C-NIM-2T
GLC-EX-SMD	Y	Y
GLC-SX-MM	Y	Y
GLC-LH-SM	Y	Y
GLC-ZX-SM	Y	Y
GLC-BX-D	Y	Y
GLC-BX-U	Y	Y
GLC-BX80-D-I	Y	Y
GLC-BX80-U-I	Y	Y
GLC-BX40-D-I	Y	Y
GLC-BX40-U-I	Y	Y
GLC-BX40-DA-I	Y	Y
GLC-LX-SM-RGD	Y	Y
DWDM-SFP	Y	N
DWDM-SFP10G	Y	N
GLC-FE-100FX	N	Y
GLC-FE-100LX	N	Y
GLC-FE-100EX	N	Y

Y= Supported, N= Not supported.

C-SM-NIM-ADPT supported modules

Table 6 shows the modules supported by the C-SM-NIM-ADPT adapter.

Table 6.   C-SM-NIM-ADPT modules supported

Product ID	Category
NIM-LTEA-EA	LTE NIM
NIM-LTEA-LA	
NIM-VAB-A	DSL NIM
NIM-VA-B	
NIM-VAB-M	

Product ID	Category
NIM-1T	WAN NIM
NIM-2T	
NIM-4T	
NIM-16A	Async NIM
NIM-24A	
NIM-1CE1T1-PRI	WAN NIM
NIM-2CE1T1-PRI	
NIM-8CE1T1-PRI	
NIM-2BRI-S/T	Voice NIM
NIM-4BRI-S/T	
NIM-xMFT-T1/E1 (x=1, 2, 4, 8)	
NIM-2FXSP	
NIM-4FXSP	
NIM-2FXS/4FXOP	
NIM-2FXO	
NIM-4FXO	
NIM-4E/M	
NIM-2BRI-NT/TE	
NIM-4BRI-NT/TE	
NIM-ES2-4	WAN/LAN NIM
NIM-ES2-8	
NIM-ES2-8-P	
C-NIM-2T	
C-NIM-1M	
C-NIM-1X	

Installation

You can install service modules and network modules either before or after mounting the router. The 1- and 2-port NIMs also support the SM-X slot with the adapter card (C-SM-NIM-ADPT). The 1- and 2-port NIMs support full Online Insertion and Removal (OIR) when installed in the SM-X adapter card. When installed directly in a NIM slot, only online insertion is supported, not online removal. This means that you can insert a NIM directly into a NIM slot while the router is powered on, but you cannot remove it unless the router is powered down.

Warning: To comply with the Telcordia GR-1089 Network Equipment Building Standards (NEBS) for electromagnetic compatibility and safety, connect the Gigabit Ethernet ports only to intrabuilding or unexposed wiring or cable. The intrabuilding cable must be shielded and the shield must be grounded at both ends. The intrabuilding port(s) of the equipment or subassembly must not be metallically connected to interfaces that connect to the Outside Plant (OSP) or its wiring. These interfaces are designed for use as intrabuilding interfaces only for Type 2 or Type 4 ports as described in Telcordia GR-1089-CORE, and they require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

Configuration

For configuration instructions, refer to the [Cisco Catalyst 8300 and 8200 Series Edge Platforms Software Configuration Guide](#).

Physical specifications

Tables 7 and 8 list the physical and environmental specifications, respectively, of the Gigabit Ethernet WAN service modules.

Table 7.   Physical specifications

	C-NIM-1X	C-NIM-2T	C-NIM-1M	C-SM-NIM-ADPT
Form factor	NIM	NIM	NIM	SM-X
Dimensions (H x W x D)	1.25 x 3.50 x 7.24 in. (32 x 89 x 184 mm)	1.25 x 3.50 x 7.24 in. (32 x 89 x 184 mm)	1.25 x 3.50 x 7.24 in. (32 x 89 x 184 mm)	1.57 x 8.11 x 8.15 in (40 x 206 x 207 mm)
Weight	240 grams	360 grams	350 grams	500 grams

Table 8. Environmental specifications

	C-NIM-1X	C-NIM-2T	C-NIM-1M	C-SM-NIM-ADPT
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)
Storage temperature	–38° to 150°F (–40° to 70°C)	–38° to 150°F (–40° to 70°C)	–38° to 150°F (–40° to 70°C)	–38° to 150°F (–40° to 70°C)
Relative humidity	5% to 95%	5% to 95%	5% to 95%	5% to 95%
Operating humidity	5% to 85%	5% to 85%	5% to 85%	5% to 85%

Table 9. Product sustainability

Sustainability Topic		Reference
General	Information on product-material-content laws and regulations	Materials
	Information on electronic waste laws and regulations, including our products, batteries and packaging	WEEE Compliance
	Information on product takeback and resuse program	Cisco Takeback and Reuse Program
	Sustainability Inquiries	Contact: csr_inquiries@cisco.com
	Environmental specifications	Table 8. Environmental specifications
Material	Product packaging weight and materials	Contact: environment@cisco.com
	Size and Weights	Table 7. Physical specifications

Ordering information

Table 10 gives ordering information for the Catalyst 8000 Gigabit Ethernet WAN Modules.

Table 10. Ordering information

Part number	Description
C-NIM-1X (=)	Cisco 1-port 10-Gbps/1-Gbps SFP+ WAN, Network Interface Module
C-NIM-2T (=)	Cisco 2-port 100-Mbps/1-Gbps dual-mode GE/SFP, Network Interface Module
C-NIM-1M (=)	Cisco 1--ort 2.5-Gbps/1-Gbps RJ-45 WAN, Network Interface Module
C-SM-NIM-ADPT (=)	Cisco single-wide 2x NIM carrier module in SM-X form factor

Technical assistance

The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical problems with Cisco products and technologies.

To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) feeds.

Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.

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