



Installing the Cisco VDSL2 and ADSL2/2+ Network Interface Modules

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This document provides information that you should know before and during the installation of the Cisco VDSL2 and ADSL2/2+ Network Interface Modules (NIMs) in the Cisco 4000 Series Integrated Services Routers (Cisco 4000 Series ISRs). This document contains the following sections:

- [Overview, page 1](#)
- [Recommended Practices for Cisco VDSL2 and ADSL2/2+ NIMs, page 3](#)
- [Cisco VDSL2 and ADSL2/2+ NIMs, page 7](#)
- [Installing the Cisco VDSL2 and ADSL2/2+ NIM, page 9](#)
- [Related Documents, page 11](#)

Overview

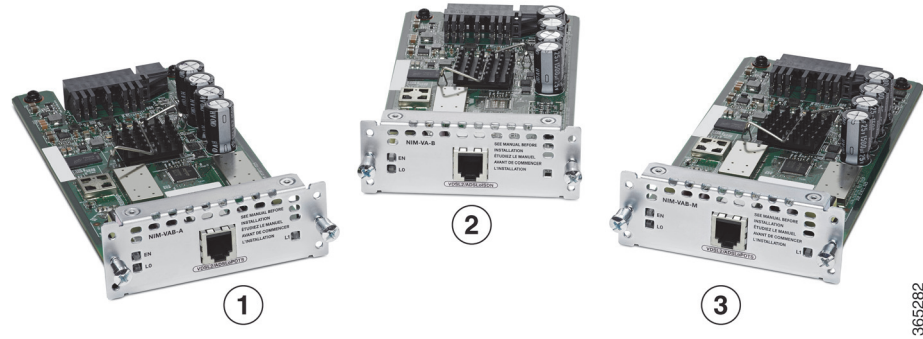
The Cisco VDSL2 and ADSL2/2+ NIMs are inserted into the NIM slot of the Cisco 4000 Series ISRs. The Cisco VDSL2 and ADSL2/2+ NIMs provide reliable WAN connections for remote sites. These NIMs offer cost-effective virtualized WAN connections in both point-to-point and point-to-multipoint networks.



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Figure 1 shows the types of Cisco VDSL2 and ADSL2/2+ NIMs that are available and Table 1 provides the description.

Figure 1 Types of Cisco VDSL2 and ADSL2/2+ NIMs



1	NIM-VAB-A	2	NIM-VA-B
3	NIM-VAB-M		

Table 1 Description of the Cisco VDSL2 and ADSL2/2+ NIMs

Cisco VDSL2 and ADSL2/2+ NIMs SKU	Description
NIM-VAB-A	1-port (2-pair) VDSL2/ADSL2+ NIM over POTS <ul style="list-style-type: none"> • VDSL2 over POTS Band Plans <ul style="list-style-type: none"> - VDSL2 profiles: 8a, 8b, 8c, 8d, 12a, 12b, 17a - VDSL2 bonding (of pair 0 and pair 1) - Profile 30a (over pair 1) - Vectoring • ADSL1/2/2+ Annex A, ADSL2 Annex L, non-optimized ADSL2/2+ Annex M

Table 1 Description of the Cisco VDSL2 and ADSL2/2+ NIMs (continued)

Cisco VDSL2 and ADSL2/2+ NIMs SKU	Description
NIM-VA-B	1-port (1-pair) VDSL2/ADSL2+ NIM over ISDN <ul style="list-style-type: none"> • ADSL1/2/2+ Annex B, non-optimized ADSL2/2+ Annex J • VDSL2 over ISDN Band Plans (8a to 17a) with Vectoring Note The NIM-VA-B supports a single DSL line and does not support bonding.
NIM-VAB-M	1-port (2-pair) VDSL2/ADSL2+ NIM over POTS with Annex M <ul style="list-style-type: none"> • VDSL2 over POTS Band Plans <ul style="list-style-type: none"> – VDSL2 profiles: 8a, 8b, 8c, 8d, 12a, 12b, 17a – VDSL2 bonding (of pair 0 and pair 1) – Profile 30a (over pair 1) – Vectoring • Optimized ADSL2/2+ Annex M • ADSL/ADSL2/2+ Annex A

Recommended Practices for Cisco VDSL2 and ADSL2/2+ NIMs

This section describes recommended practices for safe and effective installation of the hardware described in this document.

- [Safety Recommendations, page 3](#)
- [Preventing Electrostatic Discharge Damage, page 4](#)
- [General Maintenance Guidelines, page 5](#)
- [Safety Warnings, page 5](#)

Safety Recommendations

To prevent hazardous conditions, follow these safety recommendations while working with this equipment:

- Keep tools away from walk areas where you or others could fall over them.
- Do not wear loose clothing around the router. Fasten your tie or scarf and roll up your sleeves to prevent clothing from being caught in the chassis.
- Wear safety glasses when working under any conditions that might be hazardous to your eyes.
- Locate the emergency power-off switch in the room before you start working. If an electrical accident occurs, shut the power off.
- Before working on the router, turn off the power and unplug the power cord.
- Disconnect all power sources before doing the following:
 - Installing or removing a router chassis

- Working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Always check that power is disconnected from a circuit.
- Remove possible hazards from your work area, such as damp floors, ungrounded power extension cables, or missing safety grounds.
- If an electrical accident occurs, proceed as follows:
 - Use caution; do not become a victim yourself.
 - Turn off power to the room using the emergency power-off switch.
 - Determine the condition of the victim and send another person to get medical aid or call for help.
 - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Preventing Electrostatic Discharge Damage

Electrostatic discharge can damage equipment and electrical circuitry. Electrostatic discharge occurs when electronic printed circuit cards, such as those used in Cisco service modules and network modules, are improperly handled and can result in complete or intermittent equipment failure. Always observe the following electrostatic discharge damage (ESD) prevention procedures when installing, removing, or replacing any electronic printed circuit cards:

- Make sure that the router chassis is electrically connected to earth ground.
- Wear an ESD-preventive wrist strap, and make sure that it makes good contact with your skin.
- Connect the wrist strap clip to an unpainted portion of the chassis frame to channel unwanted ESD voltages to ground.



Caution The wrist strap and clip must be used correctly to ensure proper ESD protection. Periodically confirm that the resistance value of the ESD-preventive wrist strap is between 1 and 10 megohms (Mohm).

- If no wrist strap is available, ground yourself by touching the metal part of the router chassis.

General Maintenance Guidelines

The following maintenance guidelines apply to the Cisco VDSL2 and ADSL2/2+ Network Interface Modules:

- Keep the router chassis area clear and dust-free during and after installation.
- If you remove the chassis cover for any reason, store it in a safe place.
- Do not perform any action that creates a hazard to people or makes equipment unsafe.
- Keep walk areas clear to prevent falls or damage to equipment.
- Follow installation and maintenance procedures as documented by Cisco Systems, Inc.

Safety Warnings

The following safety warning statements apply to all hardware procedures involving the Cisco VDSL2 and ADSL2/2+ NIMs for Cisco 4000 Series ISRs. Translations of these warnings are available in the *Cisco Network Modules and Interface Cards Regulatory Compliance and Safety Information* document, which ships with all individual Cisco VDSL2 and ADSL2/2+ NIM orders, and is also available online.



Warning

IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

Statement 1071

SAVE THESE INSTRUCTIONS



Warning

Read the installation instructions before connecting the system to the power source. Statement 1004



Warning

To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord. Statement 1023



Warning

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028



Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

Statement 1030



Warning

Do not use this product near water; for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool. Statement 1035



Warning Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations. Statement 1036



Warning Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface. Statement 1037



Warning Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning. Statement 1038



Warning To report a gas leak, do not use a telephone in the vicinity of the leak. Statement 1039



Warning Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040



Warning When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046

The following warnings apply in Australia:



Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43



Warning Because invisible laser radiation may be emitted from the aperture of the port when no fiber cable is connected, avoid exposure to laser radiation and do not stare into open apertures. Statement 125



Warning Do not work on the system or connect or disconnect cables during periods of lightning activity. Statement 1001



Warning To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Both LAN and WAN ports may use RJ-45 connectors. Use caution when connecting cables. Statement 1021



Warning Hazardous network voltages are present in WAN ports regardless of whether power to the router is OFF or ON. To avoid electric shock, use caution when working near WAN ports. When detaching cables, detach the end away from the router first. Statement 1026



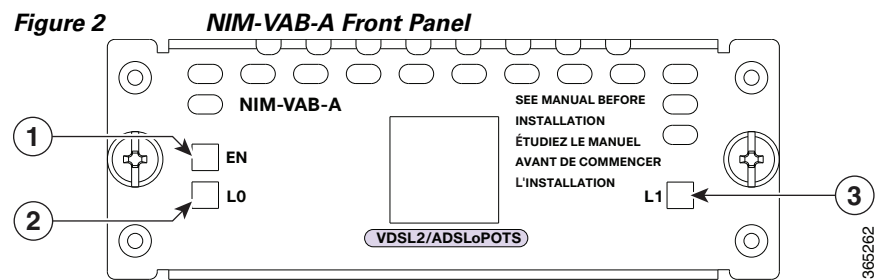
Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages. Statement 1041



The telecommunications lines must be disconnected 1) before unplugging the main power connector and/or 2) while the housing is open. Statement 1043

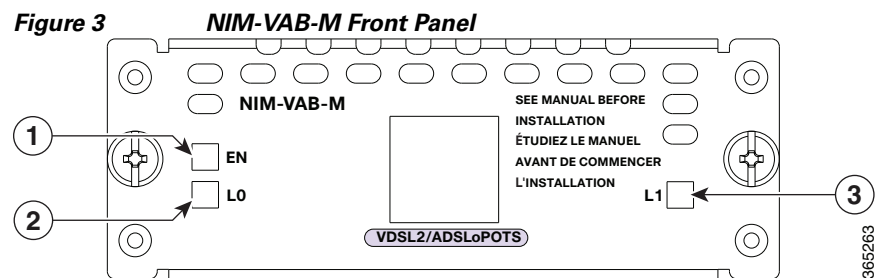
Cisco VDSL2 and ADSL2/2+ NIMs

Figure 2 shows the front panel of the NIM-VAB-A. The LEDs are described in Table 2 on page 8.



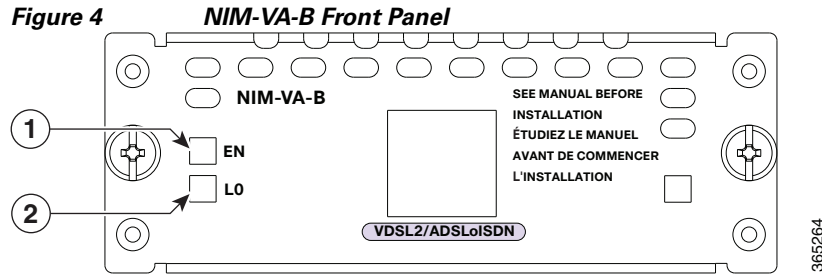
1	EN LED	2	L1 LED
3	LO LED		

Figure 3 shows the front panel of the NIM-VAB-M. The LEDs are described in Table 2 on page 8.



1	EN LED	2	L1 LED
3	LO LED		

Figure 4 shows the front panel of the NIM-VA-B. The LEDs are described in Table 2 on page 8.



1	EN LED	2	L0 LED
			<p>Note The NIM-VA-B does not have an L1 LED since it only supports a single DSL line and does not support Bonding.</p>

LEDs

The LEDs are located on the front panel and are described in Table 2.

Table 2 *LEDs*

LEDs	Color	Description
EN	Off	The NIM is either not yet powered on or is in the process of authenticating the hardware and software.
	Solid Green	The NIM is powered on and is functioning properly.
	Solid Yellow	The NIM either has some failure or is powered down.
L0	Off	Line 0 is either disabled or shutdown.
	Blinking Green ¹	Line 0 DSL link is training.
	Solid Green ²	Line 0 DSL link is active.
L1 ³	Off	Line 1 is either disabled or shutdown.
	Blinking Green ¹	Line 1 DSL link is training.
	Solid Green ²	Line 1 DSL link is active.

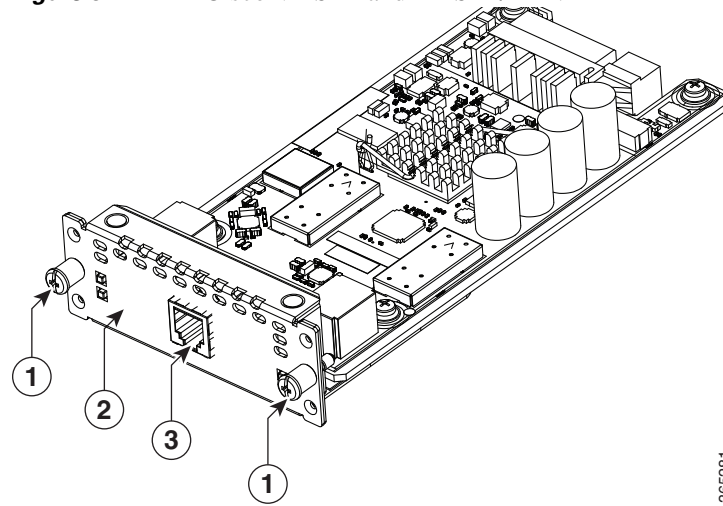
1.If both the L0 and L1 LEDs are blinking green or if one of them is blinking green and the other LED is solid green, it indicates that the Bonding mode is enabled.

2.If both L0 and L1 LEDs are solid green, it indicates that the Bonding mode is active.

3.The NIM-VA-B does not have an L1 LED since it only supports a single DSL line and does not support Bonding.

Figure 5 shows the Cisco VDSL2 and ADSL2/2+ NIM.

Figure 5 Cisco VDSL2 and ADSL2/2+ NIM



1	Screws	2	NIM
3	Port		

Installing the Cisco VDSL2 and ADSL2/2+ NIM

This section describes the installation tasks for installing the Cisco VDSL2 and ADSL2/2+ NIM into a Cisco 4000 Series ISR.

- [Tools and Equipment Required During Installation](#)
- [Installing the Cisco VDSL2 and ADSL2/2+ NIMs into the Cisco 4000 Series ISRs](#)
- [Removing the Cisco VDSL2 and ADSL2/2+ NIM from the Cisco 4000 Series ISRs](#)

Tools and Equipment Required During Installation

You will need the following tools and equipment while working with the Cisco VDSL2 and ADSL2/2+ NIMs:

- Number 1 Phillips screwdriver or a small flat-blade screwdriver
- ESD-preventive wrist strap



Warning

No user-serviceable parts inside. Do not open. Statement 1073



Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

Installing the Cisco VDSL2 and ADSL2/2+ NIMs into the Cisco 4000 Series ISRs

Procedure

Step 1 Shut down the electrical power to the slot in the router either by turning off the electrical power to the router or by issuing the online insertion and removal (OIR) commands. Leave the power cable plugged in to channel ESD voltages to ground. For more information on OIR, see the “Managing Cisco Enhanced Services and Network Interface Modules” chapter in the *Cisco 4000 Series ISRs Software Configuration Guide*.

Step 2 Remove all network cables, including telephone cables, from the rear panel of the router.

Step 3 Remove the blank faceplates installed over the network interface module slot that you intend to use.



Tip Save the blank faceplates for future use.

Step 4 Align the module with the guides in the chassis walls or slot divider and slide it gently into the NIM slot on the router.

Step 5 Push the module into place until you feel the edge connector seat securely into the connector on the router backplane. The module faceplate should contact the chassis rear panel.

Step 6 Using a number 1 Phillips or flat-blade screwdriver, tighten the captive screws on the NIM.

Step 7 Connect the module to the network and re-enable the power to the slot in the router.



Tip See the “[Related Documents](#)” section on page 11 for information on locating additional hardware documentation.

Removing the Cisco VDSL2 and ADSL2/2+ NIM from the Cisco 4000 Series ISRs

Procedure

Step 1 Shut down the electrical power to the slot in the router either by turning off the electrical power to the router or by issuing the online insertion and removal (OIR) commands. Leave the power cable plugged in to channel ESD voltages to ground. For more information on OIR, see the “Managing Cisco Enhanced Services and Network Interface Modules” chapter in the *Cisco 4000 Series ISRs Software Configuration Guide*.

Step 2 Remove all network cables, including telephone cables, from the rear panel of the router.

Step 3 Using a number 1 Phillips or flat-blade screwdriver, loosen the captive screws on the NIM.

Step 4 Slide the NIM out.

Step 5 If you are not replacing the NIM, install a blank faceplate over the empty slot to ensure proper air flow.

Related Documents

Related Topic	Document Title
Information about installing the Cisco 4000 Series ISRs.	<i>Hardware Installation Guide for the Cisco 4000 Series Integrated Services Router</i>
Information about configuring the Cisco 4000 Series ISRs.	<i>Cisco 4000 Series ISRs Software Configuration Guide</i>
Information about configuring the Cisco VDSL2 and ADSL2/2+ NIMs.	<i>VDSL2 and ADSL2/2+ NIM Configuration Guide for Cisco 4000 Series Integrated Service Routers</i>
Information about DSLAM interoperability.	<i>Cisco Multimode VDSL2 and ADSL2/2 Network Interface Module Data Sheet</i>
Regulatory compliance and safety information	<i>Cisco Network Modules and Interface Cards Regulatory Compliance and Safety Information</i>

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