



Connecting Cisco AXP Enhanced Network Modules to the Network

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This guide describes how to connect Cisco Application eXtension Platform (AXP) enhanced network modules to your network. It contains the following sections:

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Cisco Application eXtension Platform Enhanced Network Modules

The Cisco Application eXtension Platform enhanced network module (NME-APPRE family of devices) allows third parties such as system integrators, managed service providers, and large enterprise customers to extend the functionality of Cisco integrated services routers by providing their own value-added integrated services. On the network module, the Cisco Application eXtension platform hosts applications in a separate runtime environment with dedicated resources.

All models ship from the factory with the hardware preinstalled as listed in [Table 1](#).

Table 1 *Preinstalled Hardware in Cisco Application eXtension Platform Enhanced Network Modules*

Model	Processor	Hard Disk	Memory
NME-APPRE-302-K9	1.0 GHz	80 GB (SATA)	512 MB
NME-APPRE-502-K9	1.0 GHz	120 GB (SATA)	1 GB
NME-APPRE-522-K9	1.4 GHz	160 GB (SATA)	2 GB



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Note

The NME-APPRE-502-K9 enhanced network module requires Cisco Application eXtension Platform 1.1 or later.


Note

In addition to the NME-APPRE enhanced network modules, there is a Cisco Application eXtension Platform advanced integration module (AIM). For information about installing the AIM-APPRE-102-K9 module, see the hardware installation guide for your router.


Note

The compact flash (CF) slot, though available on the hardware, is not supported by the Cisco Application eXtension Platform enhanced network module. The CF slot has a metal cover.

The Cisco Application eXtension Platform enhanced network module LEDs are shown in [Figure 1](#) and described in [Table 2](#).

Figure 1 NME-APPRE Faceplate

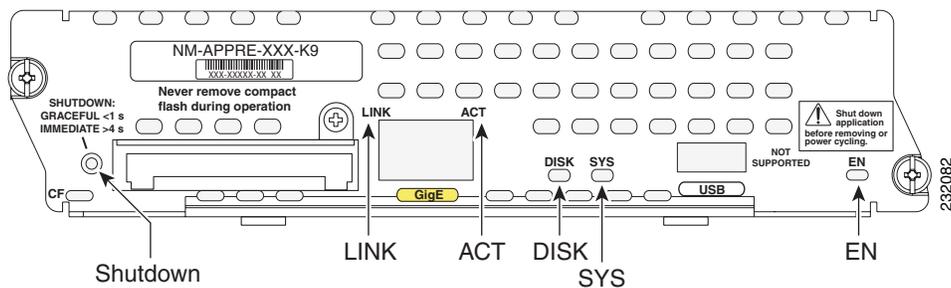


Table 2 NME-APPRE LED Descriptions

SHUTDOWN	Press the SHUTDOWN button for less than 2 seconds to gracefully shut down the module. Press the SHUTDOWN button for more than 4 seconds to cause an immediate module shutdown, which may affect file operations that are in progress.
LINK	Status of Gigabit Ethernet link: On—Link is enabled. Off—Link is disabled.
ACT	Status of Gigabit Ethernet activity: On—Active. Off—Inactive.
DISK	Status of hard drive activity: On—Active. Off—Inactive.

Table 2 NME-APPRE LED Descriptions

SYS	<p>Status of system shutdown</p> <p>Note Do not remove power without first shutting down the application.</p> <p>On—Application is stable.</p> <p>Off—System is shut down and ready for host power-down.</p> <p>Flashing—System shutdown is in progress.</p>
EN	<p>Status of the network module</p> <p>On—Detected by the host Cisco IOS software and enabled.</p> <p>Off—Disabled.</p>

Shutting Down Cisco Application eXtension Platform Enhanced Network Modules

Press the SHUTDOWN button on the network module faceplate for less than 2 seconds to perform a graceful shutdown of the network module before removing power from the router or before starting an online insertion and removal (OIR) sequence on the router. The application may take up to 2 minutes to fully shut down.



Caution

If you press the SHUTDOWN button for *more than 4 seconds*, a nongraceful shutdown of the hard disk will occur and may corrupt files on the network module's hard disk. After a nongraceful shutdown, the HD and SYS LEDs remain lit. Press the SHUTDOWN button for *less than 2 seconds* to gracefully reboot the network module.

Connecting Cisco Application eXtension Platform Enhanced Network Modules

To connect Cisco Application eXtension Platform enhanced network modules to an external device, use a straight-through two-pair Category 5e unshielded twisted-pair (UTP) cable, and connect the RJ-45 Gigabit Ethernet port on the network module to a switch, hub, repeater, server, or other Gigabit Ethernet network device.



Note

RJ-45 cables are not available from Cisco. These cables are widely available and must be Category 5e cables.

Establishing a Gigabit Ethernet Internal Connection

Use the Cisco High-Speed Intrachassis Module Interconnect (HIMI) feature to establish a Gigabit Ethernet internal logical connection between two network modules, or between an onboard small-form-factor pluggable (SFP) Gigabit Ethernet module and a network module on a Cisco 3825 router or a Cisco 3845 router.

Connections can be established only as follows:

- Between the Gigabit Ethernet port in an installed onboard SFP module on a Cisco 3825 router or a Cisco 3845 router
- Between Gigabit Ethernet interfaces in network module slots 1 and 2 on a Cisco 3825 router
- Between Gigabit Ethernet interfaces in network module slots 2 and 4 on a Cisco 3845 router

**Note**

A module interconnection between the Gigabit Ethernet port on an SFP module on the Cisco 3825 router or Cisco 3845 router and a network module slot *or* a network module-to-network module cross-connection is permitted at any given time. However, both types of connections cannot be implemented at the same time.

**Note**

Connections between the onboard Ethernet ports and network module slots are not supported.

For details about configuring HIMI connections, see the *Cisco High-Speed Intrachassis Module Interconnect (HIMI) Configuration Guide* on Cisco.com:

http://www.cisco.com/en/US/docs/ios/12_4/12_4_mainline/srdesfm1.html

Online Insertion and Removal of Cisco Network Modules Procedure

Some Cisco routers allow you to replace network modules without switching off the router or affecting the operation of other interfaces. This feature is called *online insertion and removal* (OIR). OIR of a module provides uninterrupted operation to network users, maintains routing information, and ensures session preservation.

**Caution**

Unlike other network modules, Cisco Application eXtension Platform enhanced network modules use hard disks. Online removal of enhanced network modules without proper shutdown can cause file system corruption and might render the disk unusable. You must shut down the operating system on the enhanced network module in an orderly way before removing or powering down the module.

**Caution**

Cisco routers support OIR with identical modules only. If you remove a module, install in its place another module exactly like the one you removed. If you remove a 2-slot module (along with any installed WAN or voice interface cards), install another module and card combination exactly like the one you removed.

For descriptions of informational and error messages that may appear on the console during this procedure, see the hardware installation guide for your router.

To perform online removal of a network module and insertion of a replacement, follow these steps, with the router in privileged EXEC mode:

Step 1 Initiate a network module session by using the following command:

```
Router# service-module integrated-Service-Engine slot/unit session
```

```
Trying 10.10.10.1, 2065 ... Open
```

```
SE-Module> enable
```

```
SE-Module#
```

Step 2 Save the running configuration of the network module by using the following command from the SE-Module# prompt:

```
SE-Module# copy running-config tftp tftp-server-address filename
```

Step 3 Exit the network module session by pressing **Control-Shift-6**, followed by pressing **x**.

Step 4 On the router, clear the integrated-Service-Engine console session by using the following command:

```
Router# service-module integrated-Service-Engine slot/unit session clear
```

Step 5 Perform a graceful shutdown of the network module disk drive by using the following command:

```
Router# service-module integrated-Service-Engine slot/unit shutdown
```

Step 6 Shut down the network module interface:

```
Router (config)# interface integrated-Service-Engine slot/unit
```

```
Router (config-if)# shutdown
```

```
Router (config-if)# exit
```

Step 7 Unplug all network interface cables from the network module.

Step 8 Loosen the two captive screws that are holding the network module in the chassis slot.

Step 9 Slide the network module out of the slot.

Step 10 Align the replacement network module with the guides in the chassis slot, and slide it gently into the slot.



Note If the router is not fully configured with network modules, make sure that blank panels fill the unoccupied chassis slots to provide proper airflow.

Step 11 Push the module into place until you feel its edge connector mate securely with the connector on the backplane.

Step 12 Reconnect the network interface cables that you removed in [Step 7](#).

Step 13 Check that the network module LEDs are on. This inspection ensures that connections are secure and that the new unit is operational.

Step 14 Initiate a network module session by using the following command:

```
Router# service-module integrated-Service-Engine slot/unit session
```

```
Trying 10.10.10.1, 2129 ... Open
```

```
SE-Module> enable
```

```
SE-Module#
```

Step 15 Restore the running configuration of the network module by using the following command from the service module prompt:

```
SE-Module# copy tftp running-config tftp-server-address filename
```

Step 16 Exit the network module session by pressing **Control-Shift-6**, followed by pressing **x**.

Step 17 On the router, clear the network module session by using the following command:

```
Router# service-module integrated-Service-Engine slot/unit session clear
```

Related Documents

For additional information, see the following documents and resources.

Related Topic	Document Title
Cisco Application eXtension platform software eference documentation	http://www.cisco.com/en/US/products/ps9701/tsd_products_support_series_home.html
Regulatory compliance and safety information	<i>Cisco Network Modules and Interface Cards Regulatory Compliance and Safety Information</i> http://www.cisco.com/en/US/docs/routers/access/interfaces/rcsi/IOHrcsi.html
Cisco IOS software website and reference documentation	<i>Cisco IOS Software</i> http://www.cisco.com/web/psa/products/index.html?c=268438303

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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