



Connecting AON Network Modules

This chapter describes the Cisco Application-Oriented Networking (AON) network modules for Cisco access routers, and contains the following sections:

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- [Connecting AON Network Modules, page 30-3](#)
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Tip

To determine whether your Cisco router supports a specific network module, see [Table 1-6 on page 1-16](#).

Cisco AON Network Modules

The Cisco AON network modules provide application-level intelligence, improved message visibility and security, and reduced total cost of ownership by consolidating elements of network and application infrastructures.

Two models of Cisco AON network modules are available:

- NM-AON-K9= — See [Figure 30-1 on page 30-2](#)
- NME-AON-K9= — See [Figure 30-2 on page 30-2](#)

Both Cisco AON network modules (NM) and enhanced network modules (NME) ship from the factory with the following hardware preinstalled.

Model	Hard Disk	Memory
NM-AON-K9=	40 GB (PATA)	512 MB
NME-AON-K9=	40 GB (SATA)	1 GB

Figure 30-1 NM-AON-K9= Faceplate

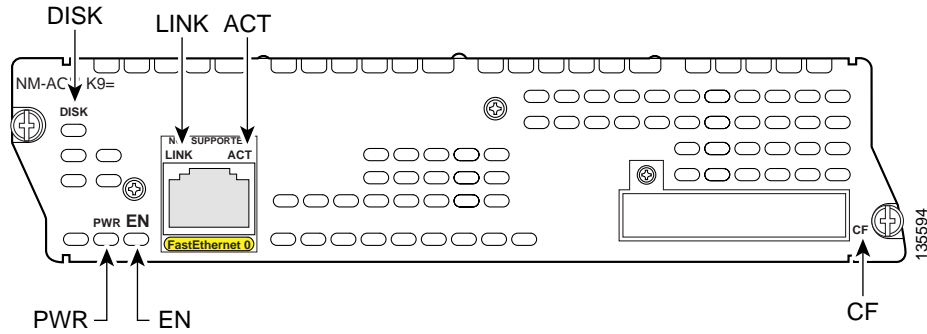
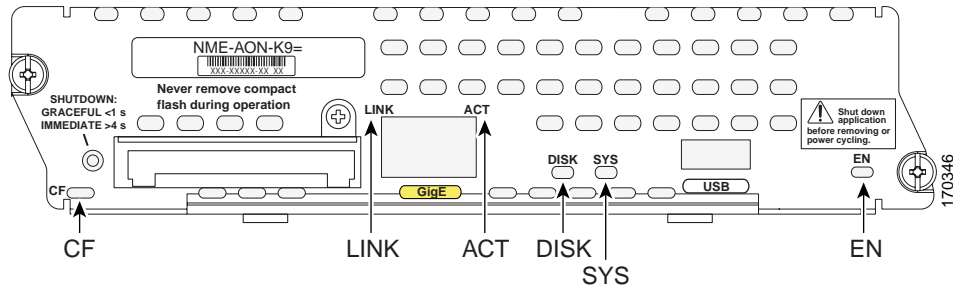


Figure 30-2 NME-AON-K9= Faceplate



DISK	Status of hard drive activity On—Active Off—Inactive
LINK	Status of Gigabit Ethernet link On—Link is enabled Off—Link is disabled
ACT	Status of Gigabit Ethernet activity On—Active Off—Inactive
PWR/SYS	Status of system shutdown Note Do not remove power without first shutting down the application. On—Application is stable. Off—System is shut down and ready for host power down Flashing—System shutdown is in progress

EN	Status of the network module On—Detected by the host Cisco IOS software and enabled Off—Disabled
CF	Status of the CompactFlash Note CompactFlash is not supported. Off—CompactFlash is not used Flashing—Application detected CompactFlash at boot up



Note

The Cisco NM-AON-K9= network module does not support a Fast Ethernet port.

Shutting Down the NME-AON-K9=

Press the reset 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 cause file corruption 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 AON Network Modules

To connect Cisco AON network modules and enhanced network modules to an external device, use a straight-through two-pair Category 5 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.



Warning

To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the NME-AON-K9 network module only to intra-building or unexposed wiring or cable. The intrabuilding cable must be shielded and the shield must be grounded at both ends. The intra-building port(s) of the equipment or subassembly must not be metallicly connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallicly to OSP wiring.



Note

RJ-45 cables are not available from Cisco Systems. These cables are widely available and must be Category 5 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 enhanced network modules, or between an onboard small-form-factor pluggable (SFP) Gigabit Ethernet module and an enhanced network module on Cisco 3825 and Cisco 3845 routers.

Connections can be only established as follows:

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



Note

The Cisco NM-AON-K9= network module does not support Gigabit Ethernet connections.



Note

A module interconnection between the Gigabit Ethernet port on an SFP module and a network module slot or a network module-to-network module cross-connection is permitted at any given time, but both types of connections cannot exist 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/products/ps5855/prod_configuration_guide09186a008068ea83.html

Online Insertion and Removal of Cisco Network Modules

Some Cisco access 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, enhanced network modules use hard disks. Online removal of disks without proper shutdown can result in file system corruption and might render the disk unusable. The operating system on the network module must be shut down in an orderly fashion before the module is removed or powered down.



Caution

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

For a description 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 using the following command:

```
Router# service-module integrated-service-engine slot/unit session

Trying 10.10.10.1, 2065 ... Open

Press RETURN to get started!

Router> enable
Router#
```

- Step 2** Save the running configuration of the network module using the following command from the **router #** prompt:

```
Router# copy running-config tftp tftp-server-address filename
```

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

- Step 4** On the router, clear the integrated-service-engine console session 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 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 previously removed in [Step 7](#).

- Step 13** Check that the network module LEDs are on and that the power (PWR) and enable (EN) LEDs on the front panel are also on. This inspection ensures that connections are secure and that the new unit is operational.

- Step 14** Initiate a network module session with the following command:

```
Router# service-module integrated-service-engine slot/unit session

Trying 10.10.10.1, 2129 ... Open

ISE-network module now available
```

Press RETURN to get started!

```
Router> enable
Router#
```

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

```
Router# copy tftp running-config tftp-server-address filename
```

- Step 16** Exit the network module session by pressing **Control-Shift-6**, followed by **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, refer to the following documents and resources.

Related Topic	Document Title
Cisco Application-Oriented Networking software installation and administration, and user guides	<i>Cisco Application-Oriented Networking Installation and Administration Guide</i> http://www.cisco.com/univercd/cc/td/doc/product/aon/aonadmin.pdf <i>Cisco Application-Oriented Networking Development Studio User Guide</i> http://www.cisco.com/univercd/cc/td/doc/product/aon/ads/index.htm
Cisco IOS software website and reference documentation	<i>Cisco IOS Software</i> http://www.cisco.com/en/US/products/sw/iosswrel/tsd_products_support_category_home.html
Technical documentation, including feedback and assistance	<i>What's New in Cisco Product Documentation</i> (including monthly listings of new and revised documents) at http://www.cisco.com/univercd/cc/td/doc/abtunicd/136957.htm

